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76-133513

DEPARTMENT OF STATE

Washington, D.C. 20520

NSC UNDER SECRETARIES COMMITTEE

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NSC-U/DM-95P

August 20, 1976

NSC REVIEW
COMPLETED,
6/26/2003

TO: The Deputy Secretary of Defense
The Assistant to the President for
National Security Affairs
The Director of Central Intelligence
The Chairman of the Joint Chiefs of Staff
The Under Secretary of the Interior
The Under Secretary of Agriculture
The Under Secretary of Commerce
The Under Secretary of Health, Education
and Welfare
The Under Secretary of Housing and Urban
Development
The Under Secretary of Transportation
The Administrator, Energy Research and
Development Administration
The Administrator, Environmental Protection
Agency
The Administrator, National Aeronautics and
Space Administration
The Director, National Science Foundation
The Director, United States Information
Agency
The Chairman, Council on Environmental
Quality

SUBJECT: Quarterly Status Reports on Implementation
of the US-USSR Bilateral Specialized
Agreements: October-December 1975 and
January-March 1976

REF: NSC-U/SM-1270

The Chairman has forwarded the attached Memorandum
to the President. A copy is provided for your
information.

Rutherford M. Poats
Rutherford M. Poats
Acting Staff Director

Attachment:
As stated

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THE DEPUTY SECRETARY OF STATE
WASHINGTON

NSC UNDER SECRETARIES COMMITTEE

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August 20, 1976

MEMORANDUM FOR THE PRESIDENT

Subject: Quarterly Status Reports on Implementation
of the US-USSR Bilateral Specialized
Agreements: October-December 1975 and
January-March 1976

I am transmitting herewith the fifteenth and sixteenth reports on the implementation of the eleven bilateral specialized cooperative agreements with the USSR. As is usual in the first quarter, there was a seasonal slackening in activity after the fourth quarter 1975. The tempo increased, though, towards the end of the first quarter 1976.

Introduction

The major development was our decision in early March to postpone three joint committee meetings involving high-ranking officials as inappropriate in view of Soviet involvement in Angola. We also informed the Soviets we were not prepared to firm up dates for joint committee meetings tentatively set for this fall. The Soviets evidently understood the reasons for our decision. They indicated a readiness to reschedule

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meetings in November or later, and significantly have moved ahead on several long-stalled projects. While working-level activity continues according to schedule, activity will slow down under a number of agreements if program decisions are not made soon at the joint committee level.

Another development which suggests that the Soviets, too, have political considerations involved in implementation of the agreements was their insistence on a site other than Puerto Rico for a meeting of marine environment experts. Although no reason was given, we suspect the Soviets did not want to prejudice their UN position with Cuba on Puerto Rico's relationship to the US. We responded by cancelling the meeting.

Increasingly, we note that a number of US agencies responsible for implementing part or all of an agreement are encountering funding problems since cooperative projects must compete for expertise and resources with other domestic programs. The pace of some cooperative projects is being hampered by limited funds for travel, translation of the growing volume of Soviet data being supplied, and for representation. Several agencies had considered asking for specific line items in their budgets to cover agreement costs, but are concerned that Congressional committees with which they deal, given their domestic orientation, will not be particularly forthcoming or interested in agency cooperative programs with the Soviets. Under several agreements, there appears to be an increasing reluctance on the part of private industry to participate in cooperative activities because they believe there is no payoff technically, commercially, or in terms of foreign policy interests.

Energy

Postponement of the March Energy Joint Committee meeting may have had an unintended beneficial result on the working level. For instance, we received a

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Soviet proposal for a US visit to the USSR on pollution concerning oil and gas operations, a project which had been dormant for almost two years awaiting a response to our suggestions. We accepted their proposal and suggested late summer dates.

There were two significant developments regarding access. The Ministry of Power and Electrification informed ERDA that two key institutes under another ministry, but long sought after by the US, would now be involved in the Superconducting Power Transmission program. In contrast, we suffered another setback in the Geothermal area in May when Moscow reiterated its unwillingness to permit a US team to visit sites in Kamchatka.

Agriculture

We sent two veterinarians to the USSR during the first quarter, leading to an exchange of veterinary materials. Three viruses received are now being tested in the US. As with several previous teams, the Soviets attempted to get a signed commitment from our first veterinarian for further US exchange cooperation. We consider these efforts to be out of order and have again pointed out that new activities must be jointly approved at the Joint Committee level.

The Soviets have unexpectedly replaced their leader of the Economic Research and Information Working Group. We know little so far about the new man, A. I. Monov of Gosplan, or about any significance for the Agreement that this change may have.

World Oceans

US Executive Secretary Donald Martineau met March 15-18 in Moscow with Soviet officials to discuss the present status of cooperation, long-standing operational problems, and timing and agenda of the next Joint Committee meeting and post-meeting tours. Progress in removing

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Soviet bureaucratic obstacles and in clarifying and solving problems resulted. The Joint Committee meeting was tentatively set for October and a post-meeting tour of US oceanographic West Coast facilities in 1976 in return for a tour of USSR Far Eastern facilities in connection with the 1977 Joint Committee meeting in the USSR was explored. However, a formal proposal for specific dates for the 1976 meeting by the US side as host is awaiting approval.

Bureaucratic difficulties appear to lie behind continued Soviet stalling on inaugurating teletype communications between the two countries' POLYMODE centers (POLYMODE refers to Mid-Ocean Dynamics experiments) and in exchanging liaison scientists for coordinating experiment plans. In our view, failure to implement these exchanges could impede the efficient carrying forward of the POLYMODE program. Agreement on these matters was reached at the working level in 1974 and were written into the Protocol of the 1975 Joint Committee meeting. Negotiations with Sidorenko on this have been particularly intense since the beginning of the year, but we are not yet sure of a positive solution. The Soviet desire to change the locus of experimentation from the North Equatorial Current to the Gulf Stream Extension System required some program adjustments but should not cause any major problems.

Housing and Other Construction

The first meeting of the New Towns Working Group exchanged drafts of a joint publication on site selection criteria for new towns. The Soviets finally reciprocated for US documentation given them, but with less detail, and largely accommodated our desire for a study tour of new towns in the USSR. Also, the Working Group on Industrialized Building Systems and Utilities met for the first time and established sub-projects for the next 18 months. HUD funding problems and a surprising lack of interest in the

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private sector may make it difficult to implement fully these sub-projects, however.

The Soviets expressed an unexpected interest in US industrial building technology using steel and aluminum as the construction materials. We had thought their primary interest was fabrication of precast/prestressed concrete beams, columns, and large concrete panel buildings. The Soviets seem to be very interested in obtaining technology currently marketed by member companies of the Metal Building Manufacturers Association, in order to erect quickly industrial buildings, factories, and warehouses for the production of other goods.

Environmental Protection

In the aftermath of our move to postpone joint committee meetings, it was also decided that EPA Administrator Russell E. Train would not attend the May 4-5 mid-year review of the Environmental Agreement in Moscow; his Executive Secretary, William A. Brown, went instead. The meeting went well but the Soviets used the occasion to press for a specific date for the Joint Committee meeting tentatively set for this fall. Having previously gotten the impression from the Soviets that Magnitogorsk was inaccessible, we were gratified that our continuing insistence led to Soviet assurances of access for our air pollution experts to the world's largest iron and steel complex there.

Our efforts to promote sales of US environmental equipment through the Agreement paid off with sales of \$1 million worth of equipment for cleaning maritime oil spills and monitoring/analysis of air pollution, with additional sales of \$3.9 million projected over the next twelve months.

We recently learned that Moscow is in the throes of creating some Soviet counterpart organization to our EPA. This development, plus increased attention

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given to environmental matters at the recent Party Congress, suggest that the Soviets may devote even more resources and effort to the US-USSR Environmental Agreement.

Space

USSR Academy of Sciences President Aleksandrov informed NASA Administrator Fletcher in February that the Academy concurs in the importance of large (visible) projects, similar to ASTP, for NASA-Soviet Academy cooperation, but that such projects require extended preparation for negotiation. This line defers indefinitely the meeting scheduled for last fall and again for this spring to lay plans for post-ASTP manned space cooperation. We suspect the Soviet position may be related to personnel and other changes in the Academy and/or possibly to changing Soviet priorities.

Informal agreement (to be finalized at September space biology and medicine working group meeting) was reached during the first quarter with the Soviets to fly five US biological experiments on the next Soviet biological satellite, presumably in the fall of 1977, as part of a scientific effort to learn more about effects of space flight on living organisms. At the same time, NASA finds disappointing the Soviet response to a suggestion for a meeting of specialist to discuss the results of the Venera-9 and -10 missions and of recent US radar observations. The Soviets agreed only to meet in June at the COSPAR (International Committee on Space Research) meeting, where we would expect them to report their Venera findings in any case. Although the Soviet data may still prove useful in June, a more timely exchange in this area could have been more helpful in planning for Pioneer-Venus missions scheduled for 1978.

Transportation

During the visit by First Deputy Minister Shumilin of the Soviet Ministry of Internal Affairs, the Soviets submitted their plan, which meets our criteria for

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testing a US-developed system which prevents a sub-par driver from starting his vehicle.

The Soviets also submitted a proposal for the joint testing of a Soviet-developed technique for increasing the service life of the bearing used in the axles of railroad cars subjected to high-loading factors. The concrete tie and draft gear (coupler) exchange and the joint testing of US selective calling equipment on a Soviet ship were completed as planned. The Soviets have now agreed to support the U.S. selective calling system in the International Telecommunications Union as the world standard. Testing of the Soviet concrete rail ties has begun in Chicago, but there are no conclusive results yet.

In a development related to the Civil Aviation Air Traffic Control Project, the Swedish firm STANSAAB approached the Department of Commerce for the licensing of US components for the Swedish ATC system purchased by the Soviet Civil Aviation Ministry. FAA, on behalf of DOT and with US private sector concurrence, is objecting to licensing action which would assist STANSAAB. Sperry-Univac, the unsuccessful US bidder, is still in contact with the Soviet Ministry of Civil Aviation, where dissatisfaction has been expressed at the technical level concerning STANSAAB's slowness in fulfilling its ATC contract.

Continuing DOT review of cooperative activities under the Transportation Agreement, taking funding problems and limited payoff potential in all eight major areas into account, could result in a decision to propose sizable cutbacks at the next Joint Committee meeting.

Science and Technology

Many delayed activities in the area of Applications of Computers to Management and in Science Policy were put in train as a result of US initiatives leading to

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an improved Soviet management of the program. However, we also experienced some backsliding when in April the Soviets postponed three scheduled computer meetings, one just a few days before a Soviet delegation was expected in the US. We have no reason to believe, however, that these postponements were in retaliation for our decision to postpone joint committee meetings.

In the Electrometallurgy area, the long-awaited Soviet high-nitrogen steel ingot arrived and is now being tested by Battelle.

Shortly after the first quarter, the Soviets accepted the substance of virtually all US positions at a meeting of the Joint Working Group on Intellectual Property. Subject to confirmation, agreement was reached on statements on inventions and on information and confidentiality.

Medical Science, Public Health, and Artificial Heart

The exchange of the first US artificial heart and its control unit took place in this first quarter, moving work in this area into joint activity. This heart, and a Soviet unit, were implanted in two calves by a joint team of surgeons in Moscow. During the visit of US surgeons, the Soviets revealed artificial heart technology which our team felt was at least as advanced as that found here.

In the priority area on Influenza and Acute Respiratory Diseases, the Soviets expressed interest in US reports on swine influenza virus-like isolates. After this finding, the USSR Ministry of Health proposed and we agreed, to have two USSR scientists visit in early April to review our most current experience with this virus.

During informal discussions, we proposed the addition of a joint project, within the cooperation on Environmental Health, to assess the biological and

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environmental effects of electromagnetic fields from high voltage power transmission lines, a topic of long-standing interest to us.

Atomic Energy

In the area of Controlled Thermonuclear Research (CTR), US experts observed the start-up of the Tokamak 10 fusion reactor at the Kurchatov Atomic Institute in Moscow. Two Soviet CTR experts participated in the start-up of the Princeton Large Torus (PLT). Such procedures permit immediate exchange of data, which can maximize the benefits to both sides.

Plans were also set during the first quarter for ERDA Assistant Administrator Richard Roberts to visit the USSR May 24-June 5 for familiarization with the Soviet Atomic Energy program. On short notice we asked the Soviets to include a visit to a Soviet atomic icebreaker. The Soviets replied that all atomic icebreakers would be at sea. Under the circumstances, we do not view the Soviet response as a firm indication that such visits are unlikely to be approved in the future and we intend to ask again.

Upcoming Events

A number of working group meetings are scheduled for the next months. Under the Oceans Agreement, there is considerable US interest in the prospect of post-Joint-Committee-meeting--whenever scheduled--travel in the Soviet Far East. The two Agriculture Agreement working groups will be holding consultative meetings in mid-June, and there will be a working group meeting in Controlled Thermonuclear Research that month, too.

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Under the Space Agreement, the COSPAR meeting will provide an opportunity for consultations with the Soviets on their Venera 9 and 10, and a Space Biology meeting is planned for Yerevan, Armenia in September. Lastly, under the Housing Agreement, HUD will be making a major effort to increase private sector involvement in the months ahead.



Charles W. Robinson
Chairman

Attachments:

1. Report for the Fourth Quarter 1975
2. Report for the First Quarter 1976

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Quarterly Status Report on the
Implementation of US-USSR
Bilateral Specialized Agreements:

October - December 1975

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INTRODUCTION

Joint Committee meetings on Science and Technology, Agriculture, Health, and Environment, held in October, were described in the last Quarterly Report.

The Joint Committee on Atomic Energy had its third annual meeting in Washington, December 3-5, 1975, and the Committee approved exploratory cooperation in thermionic research. In the Fundamental Properties of Matter area, an expanded cooperative program was approved and the Soviets indicated they accepted a multi-national approach to using large accelerators for high energy physics research. A 70% increase in man-week and joint work exchanges was approved for Controlled Thermonuclear Research for calendar year 1976.

A significant breakthrough in the Earthquake Prediction area of the Environmental Agreement appears to have been made when Soviet Co-Chairman Yuri Izrael promised to make Soviet maps, long closely held by the Soviets for security reasons, available to US experts working in the Garm region of Soviet Central Asia. In a negative development, however, a meeting on air pollution in the USSR was disappointing to the US members, mostly because of Soviet unwillingness to engage in detailed discussion after presentations were made.

The Soviets finally took steps to keep alive the Reactor

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Modeling project in the Chemical Catalysis area of the Science and Technology Agreement by nominating a Soviet research fellow. In the Electrometallurgy area, they announced that the long-awaited half-ton high-nitrogen steel ingot had been shipped from Kiev on November 18, but we have still not received it. In Microbiology, we learned that the Soviets were apparently behind us in Molecular Biology, rather than ahead of us as we had earlier assumed.

Under the Housing and Construction Agreement, for the first time a US delegation visited the Soviet Institute on Foundations and Underground Structures in Moscow, thus fulfilling a longstanding aim of the US Army Corps of Engineers, which heads the US side of work on Construction in Extreme Climates and Seismic Areas.

March 15, 1976, was set as the date for convening the long-postponed second meeting of the Energy Joint Committee. Also under this Agreement, Soviet Deputy Power Minister Maksimov stated that if the US could convince him that there were sound technical reasons for visiting geothermal installations in Kamchatka (a closed area), he would personally escort one US expert there.

For the first time in US-Soviet space cooperation, the Soviets launched on November 26 four US biological experiments on board a Cosmos (782) satellite. At the time, NASA was

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unable to accommodate these experiments, three of which concern zero gravity effects and the fourth measuring radiation; thus the Soviet launch provided us an opportunity not otherwise available.

In the Transportation Agreement, we came down hard on the Soviets for purchasing the Swedish STANSAAB Air Traffic Control (ATC) system instead of a US system by severely cutting back on cooperation on ATC. However, as our technical interests warrant, we plan to respond to Soviet efforts to restore some of the discontinued activity.

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ATOMIC ENERGY

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The Third Meeting of the US-USSR Atomic Energy Joint Committee was held in Washington, D.C. December 3-5, 1975. A. Petrosyants, Chairman of the USSR State Committee on Atomic Energy, headed the Soviet Delegation, and ERDA Administrator R. Seamans headed the US side of the Joint Committee. Representatives of the two sides reported on the results of cooperation during 1975 in the areas of Controlled Thermonuclear Research (CTR), Fast Breeder Reactors (FBR), and Research in Fundamental Properties of Matter (FPM). Programs of cooperation--involving considerable joint work--in all three areas for 1976 were approved. With the signing of the Protocol in FPM, which establishes a Joint Coordinating Committee for Fundamental Properties like those already established for CTR and FBR and defines the procedures by which the fundamental properties exchanges are to run, all three areas of US-USSR cooperation in the field of atomic energy are now formalized in ten-year official protocols.

The Joint Committee approved an exchange of delegations of specialists in thermionic research--an area in which our specialists believe the Soviets to be quite advanced--to take place during 1976 to determine if there is a mutually agreeable basis for exploring the possibility for further cooperation in this field. Both sides also agreed to the exchange of visits by experts in the field of light water

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reactors during 1976 to develop topics and possible forms of cooperation in this field for submission as recommendations at the fourth meeting of the Joint Committee in October 1976 in Moscow. US experts do not know if we stand to benefit from cooperation in this area but agreed to an exchange of visits in an effort to determine if the Soviets have anything to offer and if a mutually beneficial program of cooperation could be developed. The two sides also considered the possibility of establishing a telecommunications link, which could facilitate communications regarding questions of cooperation. The Soviets will inform us in the near future regarding measures taken for installation of such a link. Following the three-day meeting in Washington, the Soviet delegation was taken on a tour of ERDA installations and private US firms in the Pacific Northwest, California, Tennessee, and New Jersey.

Fundamental Properties of Matter

During the Joint Committee Meeting, the US and Soviet Co-Chairmen signed a protocol covering US-USSR cooperation in research on Fundamental Properties of Matter. In addition, Annex I to the Protocol covering regulations and procedures regarding the activities of the Joint US-USSR Coordinating Committee on Fundamental Properties of Matter, Annex II to the Protocol covering liability, and an expanded cooperative

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program in Fundamental Properties of Matter--including more joint research efforts, more US-USSR research at a broader range of Soviet research institutions (Leningrad, Novosibirsk, Alma-Ata)--for calendar year 1976 were officially approved. The protocol signed in December represents the first effort at working out a program of joint work for a year's period in the Fundamental Properties area.

It was agreed at a November 1975 meeting at the European Organization for Nuclear Research (CERN), Geneva, that the first meeting of an international working group will be held in Serpukhov, USSR, in June 1976 to consider setting up a study group regarding a very large accelerator. Because of its relevance to fundamental properties physics and to the US-USSR efforts in high energy physics, this meeting constitutes a part of the 1976 joint program in Fundamental Properties of Matter. Attendance at the Serpukhov meeting will include representatives from each of the four regions of the world concerned with major activities in high energy physics--the US, USSR, CERN States, and Japan. Agreement to convene this conference in Serpukhov signifies Soviet interest in the concept of a multi-national approach to the study of high energy physics using very large accelerators too expensive for any single nation to build.

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Fast Breeder Reactors

The second meeting of the US-USSR Fast Breeder Reactor (FBR) Coordinating Committee was held in Washington, November 13-14, 1975. The FBR Joint Committee agreed to a program of cooperation for 1976-77 which was approved at the third meeting of the US-USSR Joint Committee on December 5, 1975. The 1976-77 program includes the following: Physics of Reactors (reactor calculations); exchange of fuel cladding; exchange of steam generator and intermediate heat exchanger tubing; steam generator safety--symposium and devising of detailed joint programs; "in-situ" inspection of steam generator tubes; and information exchange.

At the Joint Atomic Energy Committee meeting in December we raised the matter of those problems which we feel have inhibited the development of FBR cooperation. We cited as causes for concern the imbalance in visits to FBR installations (to date 24 for the Soviets in the US and 10 for US delegations in the USSR); Soviet inability or unwillingness to show FBR specialists component fabrication and testing facilities, and compartmentalization of knowledge in the USSR. Unless the Soviets show a willingness to be more forthcoming we are convinced that it will be impossible to proceed to joint research and development in FBR.

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Three Soviet scientists worked for three weeks with their US colleagues at the Princeton Plasma Physics Laboratory and together they succeeded in developing the first practical design for a divertor for the next generation of large tokamak experiments in both countries. The reduction and control of plasma impurities is an important part of fusion power R & D, and this successfully-designed divertor represents a major step in this area.

A US scientific team visited the Soviet Union for three weeks to work in the field of high frequency heating of fusion plasmas. The Soviets explained their development of special high power tubes for this application and have indicated a willingness to make available to the US this technology, which would have a significant effect on the development of an EBT device (microwave heated toroidal plasma system) at Holifield National Laboratory. Both sides are presently exploring the process of licensing such equipment.

The expanded program of exchanges in CTR for 1976 approved during the Joint Committee meeting provides for an increase in total man weeks of exchanges from 272 in 1975 to 462 in 1976 and an increase in the number of joint work exchanges from 10 in 1975 to 17 in 1976: the rise in the number of man weeks for 1976 in CTR reflects the changing

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emphasis of US-USSR CTR exchange--from preparatory/orientation phase to joint work projects--as scientists of both countries consult and conduct joint work in an effort to solve those problems which must be solved before prototype and demonstration thermonuclear reactors can be developed.

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MEDICAL SCIENCE AND PUBLIC HEALTH

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Joint Committee Meeting

The highlight of the last quarter was the fourth session of the US-USSR Joint Committee, held in Washington October 20-24. The Joint Committee reviewed program activities under both the Health and Artificial Heart Agreements, assessed progress, and planned 1976 joint activities. As a concrete measure of productivity of joint cooperative work during 1975, the Joint Committee noted that more than 35 articles resulting from collaboration under the Health program were published in the scientific literature of both countries. On-site reviews of arteriosclerosis and environmental health research also were made at the Research Triangle facilities in North Carolina.

The Joint Committee agreed to expand collaboration in Environmental Health to include a new problem area, "Methodological Basis for Evaluating the Biological Effect of Physical Factors in the Environment", and expanded Mental Health collaboration to include a new project area, "Organic Basis of Schizophrenia". It also took steps to resolve intellectual property issues that could arise in Health and Artificial Heart areas. The next session of the Joint Committee will be held in Moscow in October 1976.

Cardiovascular Diseases and Artificial Heart

US project chairmen assessed results to date and discussed future US-USSR cooperative work at National Heart and Lung

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Institute's (NHLI) Annual Review, held in December. Cooperative study in Pathogenesis of Arteriosclerosis continues to progress well and the goals outlined in the work plans for 1975 have been largely met. A Soviet delegation in this area visited the US in November, and attended working group sessions in Biochemistry, Cardiology, Epidemiology, and Data Handling at a number of major US facilities in these fields. As a result, the US and Soviet sides agreed on standardization of all ECG data sent to the US in these projects, and on complete revision of the food table and coding book used. The Soviet delegation also attended special meetings at NHLI on lipid research, as part of US and Soviet work in a multilateral lipid clinics program.

In the Myocardial Metabolism area, a formal US-USSR presentation was made at the annual meeting of the American Heart Association during November. In the area of Blood Transfusion work, a four-member Soviet delegation made a familiarization visit to major US blood banks during October-November. Before joint collaborative projects in this field can be implemented, it is essential for both sides to have clear knowledge of blood transfusion practices of each other. Under the Artificial Heart Agreement, arrangements were made for sending a US artificial heart device to the USSR in March 1976 for evaluation in animals.

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Cancer Research

At the Joint Committee sessions, the National Cancer Institute (NCI) raised questions with Soviet counterparts about the frequency of official meetings, which NCI considered were taking up too much of the total exchange quota. NCI suggested these official meetings be reduced, and more research specialists exchanged. The Soviets agreed, but suggested that the reduction take place within Cancer Virology and Cell Genetics, thus suggesting a preference toward clinical areas rather than basic biomedical research.

Within the Chemotherapy projects in Cancer, there have been extensive barter exchanges of valuable quantities of the newest drugs. Joint evaluative work has made significant progress with the drug Ftorafur, developed by the Soviets and provided to us in amounts totaling over \$100,000. Another example of concrete benefits in this area is represented in the planned publication in both countries of a joint monograph on "Development of Drugs for the Treatment of Cancer". Future private sector developments in the Chemotherapy area are suggested by press reports of a December agreement between the USSR State Committee for Science and Technology and Bristol-Meyers Co. The agreement centers on exchange of "anti-cancer technology", and NCI is currently exploring developments with Bristol-Meyers Co. In a disappointing vein, NCI facilitated

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the private visit of a US nurse to the Moscow Cancer Research Institute, where she noted that the Soviets were not making use of a Laminar Flow Isolation Facility which NSI had provided the Soviets, perhaps because of Soviet inexperience and inadequate training with this equipment.

At the Mammalian Somatic Cell Genetics meeting in December, the Soviets presented for the first time joint study proposals. NCI had earlier voiced concern at the Joint Committee sessions over lack of progress in this topic, and the Soviets have now responded.

A negative development was the press attention given to a US long-term researcher working in the Cancer Epidemiology area, who had encountered a long list of frustrations during his November 1974-October 1975 stay in the USSR. This researcher made available to the press his personal journal, which included strong opinions that US and Soviet authorities had not properly organized or administered his program. The Soviets responded by giving an extensive interview to the Associated Press' Moscow correspondent. HEW and NCI's views are mixed, but they consider that this airing of difficulties could help both sides to address them and move towards solutions. In NCI's view, the Soviets did unreasonably treat this individual, but the matter will be discussed by both sides at the next annual Oncology program review.

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Environmental Health

Joint research in the new Physical Factors area will begin in 1976, but initially it will focus on the effect of microwave radiation on the central nervous system, and its behavioral effects. In the long run, this research will help to establish standards governing the chronic exposure of human populations to microwave radiation. Interestingly, the Soviets currently have a more stringent exposure standard than the US.

Influenza Research

The US shipped influenza isolates to the Soviets in October, and then shipped an interferon-inducing drug for Soviet testing in November.

Arthritis Research

US contributions to cooperation have been delayed because of difficulties in funding the US investigators slated to carry out clinical studies in concert with Soviet research. Study proposals have now been received from the USSR, and will be reviewed by the US.

In the areas of Microbiology and Immunology in Arthritis, US investigators attempted to reproduce findings made by a Soviet scientist regarding cellular DNA complementary to measles virus in tissues of patients with Systematic Lupus Erthematosus. In addition, Soviet scientists succeeded in establishing a colony of a special species of mice, called NZB, from a breeding

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stock supplied by NIH in May. The Soviet colony of mice will be used in special comparative experiments later on.

Schizophrenia

Current plans set by the Joint Committee call for work on the Organic Basis of Schizophrenia to begin during 1976, and NIMH has arranged to ship certain chemical specimens to the Soviet side.

Also within the general area of Mental Health Research, there has been an interesting proposal generated between the Soviets and US private industry. The Soviet Institute of Psychiatry in Moscow had been discussing possible arrangements to purchase about two million dollars' worth of Control Data Corporation computer equipment. The Soviets have claimed that this equipment is needed for their ongoing schizophrenia research. Originally, the Soviets indicated to Control Data Corporation that the proposed equipment was part of the exchange work with NIMH, and intimated that NIMH would pay for it. NIMH authorities have made clear to Control Data Corporation that the US will not fund such a purchase, and have further advised Control Data Corporation that proper export license procedures would have to be followed. At the present time, this matter remains only a proposal, and appropriate NIMH authorities are continuing to monitor the situation within the HEW context.

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ENVIRONMENTAL PROTECTION

The highly successful October 28-31 fourth annual meeting of the Joint Committee in Washington was discussed in the last Quarterly Report. Following the meeting, the Soviet Chairman, Yuri Izrael, wrote to EPA Administrator Russell E. Train expressing deep appreciation on all counts including his October 31 meeting with President Ford. Izrael stated that the Soviet leadership's view is completely in line with the President's positive assessment of the results of the Environment Agreement.

Earthquake Prediction

As an indication of the importance the Soviets attach to the Agreement, Izrael's letter also stated that US geologists would be given the essential topographical maps and aerial photography of the Garm region of Tadzhikistan when they return later in 1976. This is one of two areas where US and Soviet seismologists are conducting important work under our earthquake prediction projects. Izrael, however, failed to mention maps for the second area, Nurek, and we are making follow-up inquiries.

Verification of seismic findings has been hindered by the absence of detailed knowledge of surface features, which such maps can hopefully provide. Hitherto the Soviet

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scientists had been unable to provide maps and photographs because of Soviet government regulations, and Izrael's undertaking represents an important breakthrough.

At the December meeting of the American Geophysical Union, US and Soviet seismologists presented fifteen papers on their joint work in earthquake prediction - another example of the level of cooperative effort attained in many projects under the Agreement.

Air Pollution

On a sour note, just as the Joint Committee meeting was opening, a US air pollution delegation returned from the USSR two days early after unsatisfactory meetings on atmospheric chemistry, aerosols, modeling, and instrumentation. Although top Soviet experts made presentations at the meetings in the USSR, attempts by the US team to engage in detailed discussions were repeatedly frustrated by a variety of excuses. Most of the research discussed by the Soviets was dated, and they generally refused to discuss their new instrumentation.

Raising this issue with Izrael during the Joint Committee meeting, Administrator Train warned that the future of this project would depend on a resolution of those problems. Izrael subsequently summoned the Soviet project

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leaders, reprimanded them, and through his staff assured us that the Soviet side would take steps to prevent a recurrence. At the same time the Soviet reply placed some of the responsibility on the US team. We had hoped that the Soviets might be more forthcoming in the fields of modeling and instrumentation, as for some time we have assumed that they have strong capabilities in them. Their failure to do so to date could stem from a concern that cooperation in this field might give us a chance to monitor chemical activities in the Soviet industrial and defense sector, and to learn their monitoring capabilities.

Congressional Hearings

Appearing before the House Subcommittee on Domestic and International Scientific Planning and Analysis for two hours on November 20, Administrator Train gave his first comprehensive testimony on the Environmental Agreement before Congress. The atmosphere was friendly and sympathetic; a Committee member who is generally skeptical of the results of detente congratulated Mr. Train's efforts and the results achieved. He characterized the testimony as "extremely informative and responsive. " Asked about the problem of funding, Train said he could not speak for the other bilateral agreements but gave his personal view that the time may be coming for line item appropriations for the Environmental Agreement.

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AGRICULTURE

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The significant developments during the quarter were meetings in Moscow of the Joint Committee and the two working groups, and the sending of three US teams to the USSR and hosting of five Soviet teams in this country.

Joint Committee Meeting

The third session of the Joint Committee took place in Moscow, October 15-17. The reports of both working groups were approved, as well as the combined list of teams to be exchanged in 1976. There was some discussion prior to the final agreement on the exchange of one veterinarian's 45-day visit in each country on a first-time experimental receiving-side-pays basis. The continuing problems with scheduling and itineraries for team exchanges were also discussed, as well as ways for dealing with the causes. We made our points orally since we have found it unproductive to force our view into the meeting record. The standoff continued on forward estimates of production, utilization, and foreign trade of major agricultural commodities, although we have implicitly linked Soviet attitudes on these matters to our willingness to expand and intensify cooperation in the agricultural sciences. It was agreed that consultative meetings of both working groups would be held in May-June 1976 in Moscow, and that the full working groups will meet in conjunction with the fourth session of the Joint Committee in Washington in September-October 1976.

The semi-annual talks on the current agricultural situation and outlook in both countries again were clouded by the failure of the Soviets to provide pertinent current data on their situation. Not only did they decline to give any estimates requested, but they held back knowledge about the sharp drops in the October 1 numbers of hogs and poultry on state and collective farms (only the small increase in the number of cattle was mentioned) and implied that the USDA estimate of Soviet grain production was fairly good (it was 170 million tons at the time as compared to their estimate of 140 million tons that later was revealed). The Soviets did provide the formality of having a representative of the Ministry of Foreign Trade make their part of the presentation on foreign trade, but he did not reveal any pertinent current data.

Research and Technology

The Research and Technology Working Group, which met October 7-10, reviewed cooperative activities in 1975 and approved plans for joint work and exchanges in 1976. The main difficulty, however, was the unexplained refusal of the Soviets to receive a US plant collection visit under the Plant Science project, originally requested for 1975, any earlier than 1977. Eight teams to explore the prospects for joint work will be exchanged in 1976, including the veterinarian's

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45-day visit in each country on an experimental receiving-side-pays basis. New work plans generally were limited to original areas of cooperation, with the real beginning of joint research involving long-term individual work in several selected areas, such as seed exchange and diagnoses of animal diseases.

Economic Research and Information

In the October 10-14 meeting of the Economic Research and Information Working Group, agreement was reached that seven teams would be exchanged in 1976, with the option of an additional team for each side. For the US, the teams would cover livestock planning, storage, forecasting, and crop observation. For the Soviets, the teams would be mostly in the Agribusiness area. In the review of the economic information exchange, we repeated previous requests for forward estimates of agricultural production, utilization, and trade, especially for grains. Although the Soviets held to their position that the annual and five-year goals being furnished fulfilled their obligation, some general willingness was indicated to work through joint forecasting study toward providing more information in the future. Agreement was reached to divide the Agribusiness project into theoretical and applications sub-projects.

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Team Visits

Of the three US teams sent, one under the auspices of the Working Group on Research and Technology got a better understanding of Soviet administrative and organizational approaches to agricultural research. We expect this to assist us in better defining areas suitable for joint work. Another US team, in the Forecasting Project, had a workshop on methodology with Soviet counterparts and again got impressions similar to those at the October 1975 meetings that the Soviets would be willing to work on a joint forecasting study in the future.

Soviet teams to the US were mostly in the Agribusiness project area and concerned use of computerized mathematical models in livestock and poultry production, vegetable oil production, Holstein-Friesian cattle breeding, and protein vitamin feed supplements. In connection with reported Soviet interest in computer uses in agriculture, we are coordinating with the US side of the S & T Agreement Working Group on Computer Applications.

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SCIENCE AND TECHNOLOGY

The major development of the quarter was the fourth meeting of the Joint Commission in early October, which was described in the third quarter report. Subsequent to this meeting there was considerable activity in all twelve areas of cooperation under the Science and Technology Agreement.

Computer Applications

In the Application of Computers to Management area, a first meeting has already taken place on Theoretical Foundations for Software, one of the new topics approved by the Joint Commission. The workshop on this topic made progress in coupling US and Soviet research efforts on mathematical software; a joint effort is underway to integrate Soviet research on languages for automatic generation of application programs with US research on mathematical software for solution of linear systems associated with management.

On the negative side, work on the Large Cities topic was slowed by the no-show, allegedly because of sickness, of an expected Soviet delegation. The US Executive Secretary has written to his Soviet counterpart to ask that steps be taken to improve communications.

Chemical Catalysis

Continued exchange of long-term chemical catalysis research fellows included a Soviet nomination under the

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reactor modeling project, thus fulfilling the working group's condition for keeping that project alive.

Electrometallurgy

In Electrometallurgy the Soviets suggested a major symposium in 1976 to assess results in all projects, but agreed with us to a 1977 date, on the ground that progress would be insufficient in 1976. However, in July the Soviet working group will critically review progress; this review is to include the presentation of six joint papers by the project leaders.

During the quarter progress was made in three projects: Solid State Joining, Plasma Arc Melting, and Electron Beam Evaporation. A work program was developed for the new Solid State Joining project during a visit of US specialists to the USSR. The two sides are working independently on various Plasma-Arc activities in preparation for subsequent comparison of results. Soviet specialists visited the US in December to firm up arrangements. The Soviet side has finished the first phase ahead of us, largely because their centralized bureaucracy permits more rapid action once a decision is made.

They report that the half-ton high-nitrogen ingot they promised to ship to us under the plasma arc project in the

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third quarter, left Kiev for the US on November 18. We have not yet received it and are seeking a definite arrival date. The Electron Beam meeting arranged details for the exchange of coated cutting tool bits and for development of a method of tool evaluation. A variety of coatings was exchanged.

The Electron Beam delegation arrived a week late because of delayed issuance of a US visa stemming from our security concerns about one member of the Soviet delegation. During a discussion of the visa problem, a high-level Soviet official asserted that the Soviet side had never denied a Soviet visa to a traveler proposed by the US for activity under the Agreement. We replied by reminding them that they did not permit travel of an American expert we proposed for a Chemical Catalysis visit to Alma Ata last March. This elicited a Soviet offer to receive the expert at Alma Ata were we to make another request.

Forestry

In the Forestry area a five-man Soviet delegation came to the United States to initiate activity in two topics, Harvesting and Reforestation. The orientation trip we organized for them emphasized mechanization and automation in these two areas. A top-level visit to the USSR is planned soon to

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prepare a strong program of exchange for 1976.

Intellectual Property

Agreement has been reached to hold the next Intellectual Property Working Group meeting in April. Meanwhile, we are consulting with US industry on the US position for assigning invention rights in third countries.

Metrology

In Metrology, US experts found Soviet ideas in the Physical Constants project novel, stimulating, and useful in developing more precise values. The two sides are considering how best to include, rather than discard, discrepant data in a least-squares adjustment of fundamental constants. The National Bureau of Standards has calibrated five Soviet thermocouples by a method different from that used by the Soviets, with better than expected results: Soviet and US calibrations agree at each temperature point within normal experimental error. Concept papers have been exchanged which outline the scope of a possible automated standards information system. A work plan which the Soviets transmitted to us on October 9 suggested four new projects: fields of measuring electromagnetic characteristics of materials at high and super-high frequencies, metrological assurance for measuring liquid and gas flow rates, metrological assurance for measurement of the quantity of oil and oil

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products transported in tankers, and humidity measurements. We are presently considering these proposals. On October 3 the Soviets said they would soon transmit to us specific proposals on fundamental research in Metrology.

Microbiology

In Microbiology a US expert visiting the USSR to explore possible benefits from cooperation in geomicrobiology called at five Soviet institutions and identified Soviet experts in four areas of interest to the US: tertiary recovery of oil, prospecting for oil and gas, extraction of metals from ores, and protection of the environment. He found much Soviet talent and superb Soviet analytical work and acquired much useful literature (two books, three booklets and 66 reprints c. 1973-1975 on the subjects of petroleum microbiology and geomicrobiology).

A US Microbiology delegation to a conference on genetics of yeast and entomopathogenic organisms in Leningrad discovered that the Soviets, while good in classical genetics were apparently behind in molecular biology. Subsequent to the meeting we obtained evidence which confirms their claim to have developed a food yeast which meets our Food and Drug Administration requirements. In another microbiology project, the US received requested Soviet enzyme papers

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which had been delayed while internal Soviet clearance was being obtained to release unpublished data. The earlier Soviet presentations had been unacceptably superficial because they were based only on published material.

A single-cell protein meeting planned for December in the US had to be postponed until February because of late receipt by the Soviets of a US letter. At a meeting of US Executive Secretaries for all the agreements cases such as this were cited to emphasize the need to use telegrams if action is required in less than two months.

Physics

In Physics, the Soviet Academy of Sciences backed away from the positive Soviet presentation at the Joint Commission meeting in October by rejecting in November a proposal to form joint panels of US and Soviet experts which would select problems to be studied and would recommend participating scientists. The rejection of this concept likely reflects a Soviet desire to prevent the US from having a voice in selecting Soviet scientists. We do not interpret the Soviet Academy's negative stance as one inconsistent with the Soviet interest expressed at the October Joint Commission Meeting in pushing ahead in the physics area. The issue appears to be primarily procedural.

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This negative Soviet position has also been reflected in their draft version of the new US-Soviet Inter-Academy Exchange Agreement. The Soviet Academy letter also recommended that the program, which has still not gotten underway at all, be broadened to include Experimental Physics, thus bringing us full circle. The Joint Commission, at its first meeting, recommended cooperation in Theoretical and Experimental Physics, whereas subsequent Joint Commission statements have been limited to Theoretical Physics. This represents an effort to get started when cooperative arrangements are simpler, since cooperation on theory would not involve equipment as joint experimentation would.

Science Policy

In the Science Policy area a National Academy of Sciences delegation visited the USSR to make plans for a joint scientific assessment of the problems of arid land agriculture as a possible case study under the Stimulation of Research Project. US work in this area is dependent upon finding the necessary funds and upon development of coordination with arid lands work under the Agricultural and Environmental Protection Agreements, as well as under the Water Resources area of the S&T Agreement.

A bottleneck in the Manpower project was partially resolved by the receipt of a Soviet outline of a report which calls for inclusion of data on the utilization of scientific and engineering personnel and to begin exchange of information specialists.

S & T Information

In the Scientific and Technical Information area a symposium was held on forecasting information requirements and services. Within two months each side is to provide the other with texts of its papers as approved for publication. There was less substance in the Soviet presentation than we had hoped for, leading us to suggest to the Soviets that our delegations may be mismatched, with the Soviets being managers, and the Americans theoreticians. The working group agreed to combine the Forecasting project with one on comparing costs and benefits.

Standardization

In Standardization, thirteen Soviet standards publications were received, twelve US standards publications were transmitted to the USSR, and three Soviet standards documents were translated, bringing the cumulative total to only five translations.

Water Resources

In the Water Resources area a Soviet delegation on

Planning and Management failed to arrive when expected, apparently due to their misreading of a message revising the itinerary. However, the visit was successfully rearranged for a week later.

The National Academy of Sciences is assisting the Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL) to make direct contact with the Soviet Academy of Sciences and its Permafrost Institute concerning research on the thermal regime within and beneath embankment dams in permafrost regions. CRREL is the principal US technical agency supporting work in the Cold Weather Construction project under the Water Resources Working Group and in related projects under the Housing, Environment, Energy, and Transportation Agreements. If the NAS effort is successful, the resulting improved contacts for CRREL could thus assist a wide range of activities under several cooperative agreements.

Other Developments

On November 18-20 a subcommittee of the House Committee on Science and Technology held hearings on the S & T Agreement. The US Chairman of the Joint Commission and the US Chairmen of the Chemical Catalysis and Electrometallurgy Working Groups appeared as witnesses. The Committee asked

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searching questions concerning US benefits and was primarily interested in obtaining information which would justify our continued involvement.

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Two working groups have held meetings since the first Joint Committee meeting last June.

Building for Extreme Climates/Unusual Conditions

The Working Group on Building for Extreme Climates and Unusual Geological Conditions met in the Soviet Union November 17-26, 1975. The meeting and professional visits to institutions in Moscow, Leningrad, and Tashkent met our expectations and requests. The Soviets carried out the agreement made during the negotiations in June to provide access to an institution they had been reluctant to make available in the past. The US delegation visited the Moscow-based Scientific Research Institute on Bases and Underground Structures, which is under the control of HUD's counterpart executive agency, the State Committee for Construction Affairs. At the Institute, the US team was exposed to an impressive array of technical experts.

At the first meeting, the working group exchanged technical publications and reached agreement to pursue two projects beginning in 1976: (1) planning, design, construction and maintenance of buildings and structures for cold regions; and (2) designing and calculating methods for construction of footings and foundations (including deep pile supports) under unusual geological conditions. These projects will be carried out through extended exchange visits (of one to three months

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duration) of technical specialists to work on current projects in each other's country. We hope to benefit from Soviet experience and technology in cold weather construction and in methods for construction of footings and foundations in permafrost. The US side submitted specific proposals for exchanges of specialists. The Soviets side agreed to examine these proposals and communicate its decision by June 1976.

New Towns

David Meeker, HUD Assistant Secretary for Community Planning and Development, has been named interim US chairman of the New Towns Working Group. The first joint meeting took place in the USSR in early February 1976.

The scheduling of other working group meetings is proceeding.

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During the quarter, it was agreed that the second Joint Committee meeting, originally scheduled for July 1975, should convene March 15, 1976 in Moscow. Some project-related activity occurred in most of the program areas during the quarter; however, no significant activity was noted in four areas: Electric Power Systems, Heat Rejection Systems, UHV, and Pollution from Oil and Gas Operations.

Fossil Fuels

The return visit of the US gas experts to the USSR was held in January. The post-meeting tour included all sites we asked to visit, with the exception of permafrost pipelines sites. We did learn enough about Soviet arctic activities during the visit to lead us to conclude that permafrost pipeline construction will probably be our highest priority gas interest. Despite our repeated requests for access, we, unfortunately, saw little on gas distribution and utilization because, the Soviets explained, this activity falls under a separate Soviet ministry. We aim to pursue this matter by identifying the ministry in question and by requesting inclusion of the subject of gas distribution and utilization, and participation by the responsible ministry during our next USSR visit. At the end of the visit both sides drew up a draft record including a listing of topics for joint cooperation. When

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approved by the respective governments, the record and its topics for cooperation will be submitted to the Joint Committee for its approval.

Soviet proposals on oil topics were received in January; these closely parallel ones we sent to the USSR in September. The Soviets did omit from their list of topics two which are of interest to us--Rapid Drilling and Down Hole Powered Drills, and Radiometric Exploration. Our response proposes that these two subjects be included among those for recommended approval at the March Energy Joint Committee meeting.

We have proposed to the Soviets that the coal topics tentatively identified for cooperative projects under the Energy Agreement be pursued under the Environmental Agreement instead.

Thermal Power and Hydropower :

First quarter 1976 dates are being considered for Thermal Power and Hydropower meetings. A Soviet Hydropower delegation paid a return visit to the US in mid-February (a US group visited the USSR in May-June 1975) and toured hydroelectric sites. The Joint Working Group met to discuss further implementation of cooperation in this area. Thus far we have been unable to identify areas for mutually

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beneficial cooperation in Hydropower, but plan to continue our attempts to do so via further discussions and, perhaps, exchanges of experts.

In the Thermal Power area, the US expects to host a US-USSR symposium on "Safety Maintenance for Fuel-Loading, Storage, and Delivery Systems" in the second quarter of 1976. Dates are also being considered for reciprocal visits to observe cycling of boiler units.

MHD

In the Magnetohydrodynamics (MHD) project, Soviet techniques being used in joint plasma diagnostic studies (carried out with Soviet equipment, by Soviet scientists) at the AVCO Mark VI facility are stimulating much interest. The USSR has developed a method and the instrumentation for measuring two critical plasma properties--temperature and conductivity--using, respectively, an automated sodium line reversal technique and a moving tuned-coil method. US MHD specialists worked closely and effectively with Soviet colleagues during the testing of US-designed and constructed MHD electrode wall sections in the Soviet U-02 facility in September in a channel which utilized USSR insulating walls. From the measurements of the thermal and electrical characteristics during the test and visual

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inspection after removal of the test section it has been determined that the US electrodes as well as the Soviet insulating walls performed satisfactorily in the first 100-hour test of US electrode walls under full MHD operating conditions. This has been confirmed from post-test measurements in the US, and much valuable information on electrode wall design has been obtained for the first time.

Superconducting Power Transmission

During their September visit to the USSR, US experts visited institutions where advanced work in various aspects of superconducting power transmission is underway, but which have not been included in the US-USSR program. They came away convinced that the circle of cooperation must be broadened to encompass those Soviet institutions which are in the forefront of superconducting power transmission research and development. The US project leader for Superconducting Transmission cooperation has requested that cooperation be broadened to include the Ministry of Electric Engineering Industries and such institutes as the All-Union Research Institute of the Cable Industry, the Electrotechnical Institute in the Name of Lenin, and the Podolsk Cable Works. Thus far the Soviets have not responded to this request.

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Solar and Geothermal Power

Solar and Geothermal projects, inactive for many months because of important differences on how to proceed, were discussed informally by Soviet and US experts in Washington in December. The Soviets say they initially agreed to these projects only to oblige us. They expressed surprise that we should be interested in cooperation in Solar Energy since, they assert, their plans for eventual use of solar energy are more modest than ours.

Despite this attitude, they suggested reviving the solar workshops which they postponed last June, and we offered to do so in February, 1976. We believe a mutually beneficial program might be developed if Soviet experts in photovoltaics became involved, and proposed that three workshops take place in February in the US, including one on photovoltaics. The Soviets responded that they were unable to assemble even a small group of experts in the photovoltaic area for a February meeting and have proposed that the workshop on this topic be held at a later date in the USSR. We have agreed with their suggestion that details for the photovoltaic visit to the USSR be discussed during the February workshops on the other topics. We have communicated to the Soviets our displeasure at the delay in holding the photovoltaic workshop, since we believe photovoltaics must be included in a Solar cooperative program.

Deputy Minister of Power Maksimov responded officially on December 3 to a US letter in which we gave technical reasons why our geothermal experts wish to visit Kamchatka. Maksimov suggested that a program of cooperation be developed excluding a visit to Kamchatka, but offered access to data from the now inoperative binary system Kamchatka electric power station as well as from a flash steam power plant still in operation there.

He told us informally during the December Joint Atomic Energy Committee meeting that his ministry refused to take over the Kamchatka binary plant in 1973 when the Academy offered it to the Ministry, as its future was so unpromising. He said that, if the US side can convince him that there is a sound technical reason to go to Kamchatka, he would personally escort one US expert. We are not sure if he can deliver on this offer, but we are putting together a more detailed technical rationale for such a visit. US direction of the Solar and Geothermal projects is being transferred from NSF to ERDA.

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WORLD OCEANS

A serious problem arose during the month of October with respect to Soviet attendance at 3 scheduled meetings which were specifically noted in the Records of Protocol. Concerned US scientists made known last-minute Soviet postponement requests for agreed-upon joint meetings. This matter was brought to the attention of Dr. Robert A. White, Chairman of the US side of the Joint Committee. US Oceans Agreement participants are convinced that the postponements reflect bureaucratic disorganization on the Soviet side rather than foot dragging, but they are equally convinced that postponements of long prearranged meetings, for which US scientists have carefully scheduled their time, not only seriously jeopardize the meetings themselves but could also be detrimental to the continued interest of US scientists in the program.

In order to minimize such disruptions in the future, Dr. White wrote to his Soviet counterpart, proposing that the US-USSR Joint Committee establish a requirement that intent to cancel or postpone a scheduled meeting must be announced at least forty-five days in advance of the date scheduled. This letter appears to have had some impact already as the meeting of the Joint Working Group on

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Biological Productivity, which the Soviets indicated they would not attend, actually took place in an abbreviated form. Dr. White has not yet received a direct response to his proposal.

In a new development, the Soviet Embassy in Washington, together with the SCST in Moscow, have on several recent occasions been helpful in getting quite rapid responses to communications and facilitating last-minute travel of Soviet specialists to meetings in the US.

On November 17, Alexander P. Vinogradov, USSR Co-Chairman of the Joint Committee, died at the age of 80. His leadership and guidance will be missed. We expect that a new USSR Co-Chairman will be named sometime during the next quarter.

The US Committee regrets the departure of Mr. John Kiely and Dr. Thomas Klingan from its membership. They have made significant contributions to the US Committee since the initiation of work under the US-USSR Ocean Agreement. Dr. Philip Eisenberg, from the National Academy of Engineering, and Miss Rozanne Ridgeway, Deputy Assistant Secretary for Oceans and Fisheries Affairs, State Department, have replaced them on the US Committee.

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Large-Scale Ocean-Atmosphere Interaction

Several project activities took place during the quarter under the Large-Scale Ocean-Atmosphere Interaction Program. The North Pacific Experiment (NORPAX) Planning Committee met October 29-31. Two Soviet scientists attended this meeting and, while there, met with the appropriate U.S. Area Coordinator to discuss cooperative programs for formal consideration by their respective countries. Both sides are considering carrying out a study of the influence of the atmosphere on the North Pacific current and on the upper layer of the mid-latitude ocean by winter storms. For such an operation in the stormy North Pacific in winter, very sea-worthy ships are required. Since few U.S. ships have the capability to operate for an extended period under very heavy sea conditions, U.S. scientists consider cooperation involving Soviet ships advantageous to the U.S. program. The Soviet scientists were positive in their approach to joint cooperation in this area but were not authorized to agree to a program. At their suggestion we have recently initiated correspondence proposing the formation of a working group of scientists to develop more specific plans for such an operation but thus far have not received any response.

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Geology, Geophysics, and Geochemistry

The Deep Sea Drilling Project received another quarter million dollars from the Soviets during the quarter. The total Soviet contribution to date has been \$1,750,000.

The Trans-Atlantic Geotraverse (TAG) field project, a study of the geology (presence of minerals and ores) and characteristics of the Central North Atlantic Ocean Basin and Continental Margins, has ended and the US and USSR are planning to compile the data in the form of an Atlas. The Atlas of the International Indian Ocean Expedition recently published by the Soviets will serve as a model for the scientific content of the Atlas.

Dr. Gleb Udintsev (USSR) and Dr. Peter Rona (US) met in December to discuss plans for the joint Atlas. Their meeting was a preliminary step to initiate the drafting of a specific proposal for presentation to the Joint Committee outlining responsibilities, costs, credits and time required to print the Atlas. The Atlas should be completed in English and Russian by the end of 1976.

Ocean Currents and Dynamics

From October 14-November 12, the Joint Large-Scale Mid-Ocean Dynamics Experiment (POLYMODE) Organizing Committee met and, in a very cooperative and businesslike

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manner, prepared joint recommendations on experimental and theoretical scientific planning and on support of scientific planning. We sent a draft record of the recommendations for Soviet comment and concurrence and received a positive response from them. In the interest of assuring prompt receipt of and action upon messages relating to the Polymode Experiment (they will proliferate as the '77 joint experiment approaches) we also prepared support documentations for installation of a US/USSR teletype linkup. Since the building in which the teletype will be housed will not be completed until spring of 1976, it is not known when the link will be finally established.

The US POLYMODE Office also arranged for five Soviet Oceanographers to visit World Data Center A, NOAA, in Washington, D.C., during October 28-November 4.

- National Oceanographic Data Center (NODC) application in automated counteracting.
- Intercalibration and testing of instrumentation.
- Application of satellite data to the POLYMODE experiment.
- Use of Integrated Global Ocean Station System (IGOSS) Data Analyses during the POLYMODE field year.

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- Digitalization and Processing of Expendable Bathy Thermograph (XBT) data.
- Potential uses of historical data for the POLYMODE program.

The Soviets are attempting to acquire a Hewlett-Packard 3000 series data management computer system (a data system in use at Woods Hole Oceanographic Institution) for the Institution of Oceanology in Moscow to facilitate joint research under the Joint US/USSR World Ocean Agreement, especially POLYMODE. This application (not to be confused with the application being made for a larger computer system under the Environmental Agreement) is being processed through the Computer Branch, Electronic and Scientific Equipment Division, Office of Export Control, Bureau of International Commerce, Washington, D.C. In view of the fact that the system is both small and not up-to-date, a positive decision is a likely possibility.

Joint Working Group Meetings

The Joint Biological Productivity Working Group held an informal meeting November 20, in Beaufort, North Carolina, during the "Symposium on Ecology of Fouling Communities," which took place under the auspices of the joint program. Both sides expressed general satisfaction with the initial phases of the Biology of Marine Fouling and Benthic Communities Project and discussed future plans

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for this program: The Soviets suggested holding a symposium, called for by the protocol document of 1975 to develop joint research programs in marine fouling and benthic communities, in Leningrad in 1976 and general agreement was reached on plans and procedures for the symposium.

The Soviet Academy of Sciences had invited (not specifically pursuant to the Ocean Agreement) two US scientists to participate on a Soviet cruise in the spring of 1976 in the Australia-New Zealand, sub-antarctic region to study the fauna of the continental slope. We asked the Soviets to determine if the US scientists' participation could be considered as part of the exchange agreement since they would be carrying out research in areas related to the "upwelling" section of the Biological Productivity Program area, and since the US-USSR protocol on oceans calls for joint work on each others vessels in the program area of "upwelling."

We made considerable preparation for Soviet participation in a meeting of the Lithospheric Plate Working Group, under Geology, Geochemistry, and Geophysics, to be held in Vail, Colorado, November 16-21. The meeting was to be the first planning step for this important area of potential cooperation. Soviet and US experts would be cooperating in basic research to better understand the

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mechanism of the driving motion of the plates which made up the earth's crust. The addition of excellent Soviet theoreticians and ships would be of great benefit to research in this area. The Soviet Co-Area Coordinator informed us at the last minute that the Soviet scientists who were to participate had not received exit permission in time, and, as noted above, this meeting never took place.

Developments Anticipated in First Quarter of 1976

On January 6, 1976 U.S. Area Coordinators met to review developments since the Second Joint Meeting in Moscow, May 1975, and also to address problems which they considered needed to be brought to the attention of the U.S. Committee at its January 15 meeting. The area coordinators reported considerable positive progress in US-USSR oceans cooperation but noted certain problems, some procedural and some of a substantive nature, which have plagued a number of the program areas under US-USSR Oceans Exchange-specifically: Soviet slowness to respond to official communications; Soviet failure to name a NORPAX working group chairman and lack of responsiveness in the Air-Sea Interaction area in general; Soviet last-minute requests for meeting postponements; and need for better definition of individual projects. US area coordinators and program chairmen will be working to better define US-USSR projects and will be devoting

effort to this end at US-USSR working group meetings.

The US Executive Secretariat plans to visit Moscow in March 1976 to discuss plans for the Third Joint Committee Meeting to take place in Washington, D.C., during the fourth quarter of 1976, and to discuss issues of concern to us relating to the conduct of exchanges. Specifically, we will raise those matters defined as problems by US area coordinators and also installation of a teletype for POLYMODE; and the drawing in to the numerical modelling exchange of the Novosibirsk Institute (where up-to-date work in numerical modelling of ocean currents and dynamics is being carried out).

We have proposed that the Second Joint Working Group Meeting of the Geology, Geophysics, and Geochemistry of the Ocean Floor take place in Honolulu, Hawaii, in the second quarter of 1976. The date and place have yet to be confirmed by the Soviets.

We agreed to a Soviet suggestion that the Joint Working Group Meeting on the Dissemination of Data be held March 1-10, 1976 in Washington, D.C.; we have replied affirmatively.

The U.S. R/V THOMPSON and the U.S.S.R. R/V PROFESSOR VIESE arrived in the Drake Passage to begin work during January and February 1976. The US ship is operating in the field phase of the ISOS project and the Soviet ship is working under the Soviet Polar Experiments

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(POLEX)-South Program. Each country is carrying out national research projects in the Drake Passage but are coordinating their efforts under the South Oceans Project of the US/USSR World Ocean Agreement. They will exchange personnel at sea, will exchange real time data and will occupy the same intercalibration stations.

Professor A. S. Sarkisyan from the Shirshov Oceanological Institute, Moscow, will begin a three-month visit in March at the NOAA Geophysical Fluid Dynamics Laboratory in Princeton University. During his stay he will also visit several other US institutions in the program area of Numerical Modelling under Ocean Currents and Dynamics.

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Space Biology and Medicine

On November 26, the Soviets for the first time in the course of US-USSR cooperation launched four US biological experiments on board a Cosmos (782) satellite. US scientists prepared, packaged, and delivered the experiments to the USSR for placing on the satellite by Soviet scientists. Three of the experiments seek to determine the effects of zero gravity on the embryonic development of simple plants and animals, while the fourth measures radiation in an orbit not flown by the US at a time of minimum solar and maximum cosmic ray activity. Since NASA has no currently scheduled missions to accommodate these experiments, their flight on a Soviet-financed satellite provided us an opportunity that would otherwise not be available. Eight NASA scientists participated in post-recovery preparation of geological materials aboard the Cosmos 782 in Moscow. All US-provided flight material was recovered in good shape and has been distributed to various investigators in the US for analysis.

NASA expects that more experiments can be flown aboard Soviet satellites in the future. During the Space Biology and Medicine Working Group meeting in August 1975, both sides agreed to future flights of US biological experiments on Soviet satellites. The Soviets suggested at that time that we outline our proposals for experiments to be flown on a Soviet satellite in 1977. We have recently responded with such a proposal.

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Post Apollo-Soyuz Cooperation

The Soviets have sent us informal signals that they are thinking in terms of a NASA/Academy meeting on post-ASTP cooperation in the US in April 1976. We are still waiting for official word. Such a meeting was agreed in principle at the informal NASA/Academy talks which took place in May 1975.

The ASTP Technical Directors and Joint Working Groups held a post-mission review at the Johnson Space Center November 10-20. In addition to completing a Joint Mission Report, they developed general recommendations based on ASTP experience in the areas of design and testing of docking mechanisms, joint mission control, and documentation to be considered in the planning and conduct of future joint flights.

We had seen this meeting as an opportunity for US and Soviet experts to resume consideration of the compatibility requirements for future systems, an activity which had been suspended to permit concentration on the ASTP flight. The Soviets declined to address the specifics of future systems at this meeting, explaining that they preferred to defer this until NASA and Academy officials had met to consider the question of post-ASTP cooperation. Another factor is

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probably the change in the Soviet Academy leadership, with Aleksandrov just having taken over as head; however, they have consistently avoided to date discussion in any detail of post-ASTP manned space cooperation.

Planetary Exploration

The US Geological Survey Center of Astrogeology at Flagstaff, Arizona, working with the digitized data tapes of Mars imagery provided by the Soviets, has succeeded in producing far better pictures of the Mars surface by US methods than the Soviets have produced by their methods. The resulting information bears importantly on the selection of alternate landing sites for the Viking missions now on the way to Mars.

The Soviets have not yet responded to our September suggestion for a working session of US and Soviet experts to discuss the results of their Venera 9 and 10 Venus landers. They have, however, provided us with prints and negatives of the remarkable photographs of the Venus surface obtained by their spacecraft, and we are using this occasion to press for a meeting devoted to Venera 9 and 10 results, new US radar observations of Venus, and plans for the NASA Pioneer Venus missions scheduled for 1978.

A successful NASA/Soviet Academy seminar on the interaction between the solar wind and the planets took place in

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Moscow November 17-21. The Soviets made competent specialists available and presented eight authoritative, detailed papers, while the Americans presented six. As a result of the meeting, which included informal, wide-ranging discussions, NASA participants believe they have all the scientifically reliable information collected by Soviet orbiters of Mars, much of which the USSR will undoubtedly publish. During the seminar, the Soviets reported on early results obtained by their Venera 9 and 10 orbiters. These results were relevant to the agreed subject of the seminar.

Natural Environment

Coordinated magnetometer observations of the earth's magnetic field by the NASA ATS-6 satellite and Soviet ground stations began on a test basis. While data is being received daily from all three participating Soviet ground stations, the quality needed to meet experiment scientific objectives has not yet been achieved. However, it appears likely that comparatively minor adjustments in the Soviet stations can bring the experiment to full operational status, particularly in view of the successful system tests conducted in the US earlier this year.

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TRANSPORTATION AGREEMENT

Activity under several areas of the Agreement progressed satisfactorily, although difficulties persisted in the Air Traffic Control (ATC) area.

Civil Aviation

We informed the Soviet Ministry of Civil Aviation through its working group representative of severe cutbacks in Air Traffic Control related cooperation because of its decision to purchase the Swedish STANSAAB system instead of a US system. Although this step was necessary to express our displeasure with the Soviet decision, we retain a continuing interest in keeping abreast of Soviet ATC developments.

We felt the Soviets would push to restore some of the discontinued activity and that we could respond to these pressures as our technical interests warrant. This approach may be working. The Ministry called in our Embassy representatives and deplored the program cuts while expressing an interest in continuing cooperation in the ATC area.

Meanwhile, a STANSAAB representative visited the US Department of Commerce January 22, 1976 to discuss procedures for obtaining an export license for US components to be included in the STANSAAB system. The Department of Commerce listened to the STANSAAB representative's pitch, advised him of the procedure for applying for a license, and

agreed to consider the application when it is received (after discussing it with interested US agencies).

A US delegation on Aviation Education and Training visited the Soviet Union October 8-19. Concepts which the Soviets demonstrated in the use of simulation equipment for training air traffic controllers may have applications for use in the US. On the other hand, the Soviet state of the art in airline crew simulation training is about a decade behind us and there may be a commercial potential in this area.

A US delegation on Joint Accident Investigation under the Civil Aviation working group visited the Soviet Union October 24-31. The Soviets provided us with comprehensive briefings and documents explaining the Soviet civil aircraft accident investigation organization, investigation procedures, data handling techniques, and pilot performance monitoring program as well as operational/maintenance manuals for the IL-62 aircraft. This data met most of the delegation's objectives and even exceeded objectives in some areas.

On the other hand, the Soviets declined to provide an annual analysis of Soviet domestic aircraft accidents under an ICAO reporting program because this document is classified for "national security" reasons. We will continue to press for this information during subsequent meetings.

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Cooperation in this area is potentially beneficial to the US because Soviet experience represents a tremendous new, untapped data base from which many new accident prevention lessons may be learned. Cooperation in this area is also helpful in improving contact with Soviet officials and could enhance the projects for prompt notification and a fair and thorough investigation of a US aircraft accident in the Soviet Union if one should occur. The Soviets are interested in learning from us in the area of accident prevention techniques, where we are more advanced than they.

A Soviet delegation on Airworthiness visited the US November 9-15. The Soviets appear to be far behind us in the area of material and product fabrication, including quality control; but they have experience and data on the effects of lightning strike on aircraft that may be of benefit to us. A return visit by a US delegation to the Soviet Union should clarify whether mutually beneficial cooperation in this area will be possible. We will continue to ensure that such cooperation does not include matters pertaining to a proposed US-USSR Airworthiness Agreement.

A Soviet delegation on Microwave Landing Systems visited the US November 20-29. The Soviets reconfirmed their

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support for the US Time Reference Scanning Beam (TRSB) technique as the world standard, and stated their intention to submit a proposal on TRSB to the International Civil Aviation Organization once sufficient technical data is available.

A Soviet delegation on Aviation in Agriculture visited the US December 5-16. During discussions with the Soviet delegation, FAA and NASA explored potential joint agricultural aviation projects. For example, Soviet research with automatic flagmen could increase productivity and decrease manpower costs for us. A visit to a medical facility in Oklahoma stimulated interest in joint efforts to improve crash survivability and protective clothing for agricultural aviation workers, which would be mutually beneficial.

Marine Transport

A Soviet delegation on Port, Harbor and Intermodal Systems visited the US October 17-31. During this visit arrangements were finalized for a six-week visit of three Soviets for training in modern aspects of port operations during January and February 1976. This training will benefit us by improving Soviet ability to handle our vessels expeditiously in Soviet ports and to prepare Soviet cargo for handling in US ports. The Soviets have agreed to a return visit by US trainees, but arrangements for this

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visit have been delayed by the cost and uncertain benefit to US firms of sending their people to the Soviet Union for training. We are much more advanced than the Soviets in normal port handling, including mechanization and automation, but our specialists may be able to learn from Soviet experience with ice bound ports when they visit the Soviet Union for training.

A Soviet delegation on Ship Equipment, Crew Training and Human Factors also visited the US October 17-31. The most important result of the visit was agreement on the testing of US selective calling communications equipment on a Soviet ship during January and February 1976. Selective calling is a system whereby a particular merchant ship at sea can be called outside of designated hours which are allotted for contacting such ships. The testing of this equipment on a Soviet ship has long been a US objective, since we hope to gain Soviet support for making our selective calling equipment the world standard. We also reached agreement in principle with the Soviets during this visit that synchronized satellite systems represent an opportunity to enhance the safety and productivity of ships at sea. We have therefore agreed to work jointly in developing standards for future systems that would be

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mutually compatible.

Rail Transport

During the November 14-23 visit to the US of a Soviet delegation on Rolling Stock, the President of Cardwell Westinghouse agreed to provide the Soviets with a draft gear for testing in the Soviet Union. Cardwell Westinghouse believes that this testing may lead to a commercial arrangement, which would include both sales to the Soviets and the acquisition of Soviet railway technology which would save us research and development costs. The Soviets had requested the gear in return for the twelve concrete railway ties which they had previously agreed to send to the US for testing.

Trade Documentation Facilitation

The Joint Working Group on Trade Documentation and Facilitation met in the Soviet Union September 29 - October 4, 1975. Agreement was reached on a joint demonstration during the last half of 1976 of the transmission of trade documentation data by teletype for ocean cargo movements between the ports of Baltimore and Leningrad. This demonstration would anticipate the ultimate use of ADP-transmitted trade documentation data. Since the US is far ahead of the Soviet Union in documentation procedures and technical equipment, the Soviets have more to gain from this project,

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but both sides have an interest in expanding trade, which cooperation in trade documentation should facilitate. We have engaged in similar cooperative projects with some of our leading trade partners.

Transport Construction

We prepared our proposal on methods of instrumenting tunnels in like soil conditions for joint stress testing of tunnel linings, which we and the Soviets had agreed to in September 1975. Our submission is almost ready for transmittal, but we have not yet heard from the Soviets.

MAJOR JOINT PROJECTS PROPOSALS

Our tentative and preliminary comments on Kosygin's October 1975 proposal to Dr. Stever for major joint projects are as follows:

Science and Technology

Electrometallurgy work under the S & T Agreement is closely related to one of the four examples which Kosygin suggested as a major project which might be developed on a priority basis in order to demonstrate to the public of both countries the benefits of cooperation, namely construction of sizable metallurgical plants in both countries to utilize new techniques of electrometallurgy. Indeed, in response to an earlier and much lower level Soviet suggestion, the Electroslag project group has agreed to conduct exploratory discussions on development of furnaces. We have been in touch with a vice president of the American Iron and Steel Institute in this connection; but there has not yet been any substantive discussion with the Soviets.

The Soviets have, from the beginning, endeavored to move the Electrometallurgy cooperative program in the direction of industrial production. We cannot go far down this road without extensive participation by private US industry. The private sector is involved to a modest extent in carrying out the current program. It is unrealistic, however, to expect private companies to expand greatly their participation until

they have had a greater opportunity to observe Soviet performance in activities already started.

If and when the promised Soviet ingots, welding materials, and other items are received, then tested, and found to have interesting qualities, then it might make sense to sound out the companies as to the feasibility of an expanded cooperative Electrometallurgy program. There is also an alternative of getting licenses to use Soviet technology.

Microbiology and Water Resources are two other areas in which mutually beneficial major projects might be developed. We are reviewing the former, however, to determine if it might require some reorientation away from its original focus in view of difficulties of access to plants manufacturing single cell protein. In the Water Resources area, we might benefit from Soviet pipeline construction techniques in cold weather regions. But in areas where cooperative work is already under way, we believe movement towards major joint projects should be paced to satisfactory progress in joint work, as already agreed.

Public Health and Medicine

A joint hospital project as suggested by Kosygin is of little interest to HEW at this time, particularly with the current excess of hospital beds in the US. A major concern in this Agreement has been the strengthening of the technical substance of joint cooperative activities to insure that they stand on their scientific merit, and we believe this is

a view shared by both sides. In that context, it might prove possible as joint work progresses to give certain existing projects more public attention, and program activities in Fundamental Epidemiological and Clinical Aspects of Cancer and Heart Disease may hold this potential.

Agriculture

USDA concludes that construction and operation of a model seed farm, as proposed by Kosygin, poses legal and financial problems to the US side, and US control could not be exercised to a degree which would insure success. However, tentative plans for joint research in wind erosion and crop production in semi-arid lands could eventually result in suitable models.

Transportation

Two ideas for high-visibility projects are being explored. One deals with joint ice transiting operations and the other with the use of satellites for maritime communications. The latter is currently undergoing the extensive interagency coordination which is necessary before a firm proposal can be drawn up. The former probably falls short of what the Soviets have in mind.

Environmental Protection

EPA concludes that in general the nature of the work and interests of its project leaders and their agencies under the Environmental Agreement do not lend themselves to

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"high-visibility" projects demanding heavy commitments of US financial and manpower resources. In all but a few areas of the Agreement, particularly those in which the Soviets seem most interested, we are far ahead of them in terms of R&D, methodology, practical application, and resource management. Therefore, the balance of benefit from "high-visibility" projects in these areas would probably strongly favor the Soviet side.

Given Kosygin's desire for "high-visibility" projects, increasing Soviet emphasis on producing concrete results with practical application rather than pure research, and our own preference for projects which demonstrate payoff to the US, we might wish to consider upgrading to a "high-visibility" option the one area which so far has directly produced the most outstanding results under the Environmental Agreement--Earthquake Prediction and Hazard Reduction.

Already we have had significant payoff from joint work in this field, particularly from the data we have obtained from measuring the effects of the partial filling of the Nurek Dam in Tadzhikistan in triggering earthquakes. These and later data will have great import for the future selection and construction of dams in seismic areas in the USA, the USSR and elsewhere. With the additional injection

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of several million dollars into this and other projects under US-USSR programs for earthquake prediction, estimation of seismic risk, and earthquake resistant design and planning, we could obtain even more significant results which could be publicized as unique contributions of the Environmental Agreement to the safety and livelihood of large US, Soviet and third country populations living in earthquake-prone areas.

Considering the great potential payoff, we believe the Soviets would be receptive to such a proposal. Ironically, however, at this juncture the US Geological Survey earthquake prediction program faces serious budget cuts which, in view of other domestic priorities, threaten drastic cutbacks on USGS participation in the Environmental Agreement, costing approximately \$100,000 in FY 76. Therefore, if we wish to go to a "high-visibility" option, USGS would have to get a supplementary appropriation from Congress or some other external funding.

Space

Whatever the reason for the Kosygin suggestion that the US and the USSR consider high-visibility projects, NASA considers that such projects have considerable merit from a US point of view. They can be more easily structured than scores of smaller activities to serve national

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political technical objectives, and NASA believes that the Soviets perform better when they are publicly committed to a project in which success and failure can easily be measured. The NASA/Academy talks on post-ASTP cooperation which NASA expects to take place in April 1976 offer an opportunity to test the seriousness of Soviet interest in significant follow-on projects already discussed by NASA/Academy representatives. NASA plans to push for joint operations involving the US Space Shuttle and Soviet spacecraft which will be flying in the nineteen-eighties. Such operations would rate with ASTP as a public demonstration of US/USSR commitment to technical cooperation in areas of common interest despite differing social and political systems.

World Oceans Studies

There are now a total of fifteen cooperative projects. Rather than initiate additional projects the US side has decided to limit further initiatives in order to assure meaningful conclusions of those already started. However, within the present Agreement two major efforts are underway that can and should be considered as Major Joint Projects-- POLYMODE and the Deep Sea Drilling Project. These projects are underway and for POLYMODE the major effort will be in 1977-78. The Deep Sea Drilling Project is being explored

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for such consideration, however, it is a multi-national project, and therefore does not lend itself easily to the kind of project Kosygin may have had in mind.

Housing and Construction

Construction projects would lend themselves admirably to the presumed interest of Soviet authorities in giving "high-visibility" to the benefits of technical and other cooperation between the two countries. The Housing and Other Construction Agreement would seem to be an appropriate vehicle under which the two countries would carry out such construction projects.

The Soviet Co-Chairman of the Agreement, Mr. Novikov, is "Mr. Construction" of the Soviet Union and one of the most highly visible projects in which he is directly involved is the 1980 Olympics in Moscow. It might be useful to discuss the idea of the US and the USSR designing and building one or more of the structures required for the Moscow games. An astrodome, where the US has done the most advanced work, readily comes to mind. The construction of modern hotel facilities and/or housing in the manner of Olympic Village at Munich, is another obvious area where US expertise could contribute.

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Such a joint project could also conceivably provide jobs for US professional and supervisory construction worker personnel. The US private sector would obviously have to participate in such a project, but the exact mix of private and governmental involvement would have to be determined.

Approximately eighteen months ago we became aware that Mr. Kosygin's son-in-law, D.M. Gvishiani, had contacted two or three prominent US planning and design firms in connection with an idea for constructing a new town in or near Moscow. Perhaps this project could be resurrected or it may, in fact, be related to the 1980 Olympic Games complex.

If this proposal for high-visibility joint construction project(s) has merit for the US, and if the Soviets accept it, we could then explore with them the possibility of moving ahead on preliminary plans for such cooperation in time to formally announce them at the Vancouver UN Human Settlements Conference (HABITAT) in June 1976. Such a joint announcement at the conference would obviously provide high national and international visibility and further demonstrate the growing US-USSR cooperation in an area of great interest to most countries.

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Energy

Under the Energy Agreement, MHD may have potential as a major project. Practical results with a major impact on the US MHD program are expected from the joint U-02 tests, which will contribute to the development of a viable MHD electrode system, and from the planned operation of a large-scale US-built channel for 100+ hours in the Soviet U-25. Although our MHD program is a long-term effort, in which a commercial-scale, coal-fired demonstration plant is not expected to be built until perhaps 1989, we could conceivably participate in the Soviet project to build a natural gas-fired plant (the U-600), which is currently planned for initial start-up in 1982.

The Soviets have proposed informally at the technical level joint designing and building of commercial MHD stations in each country and the two sides have started discussion of possible joint activities in this area. However, there are major political, technical, and financial issues to be considered before an intensive, priority effort is undertaken in cooperation with the Soviets in MHD.

Atomic Energy

Under the Atomic Energy Agreement, cooperation in Fast Breeder Reactors, a major project could be the testing of a US Clinch River Breeder Reactor (CRBR) prototype steam generator

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evaporator at CRBR pressure and temperature conditions in Soviet BN-350 spare loop at Shevchenko.

On February 25, 1976, technical details for the study of the possibility of such testing were forwarded to the USSR State Committee on Atomic Energy by diplomatic pouch and an early response was requested. The US proposal does not obligate either side to any commitments other than those necessary to make a technical evaluation of the feasibility of proceeding with such a joint project. If the US proposal is jointly agreed to and the details are worked out to the satisfaction of both sides, the unit could be delivered to Shevchenko in 1979 for testing in the spare loop of BN-350 at prototypical CRBR conditions for a period of five years.

The testing of this prototype evaporator in an operating USSR Fast Breeder Reactor would help validate the US CRBR design, and the detailed analysis and testing which supports this design for use in the US CRBR 350MWe demonstration plant scheduled for completion in 1983. The USSR could gain by having access to testing results on a steam generator of a type they do not have.

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INTRODUCTION

The regular pace of US-USSR cooperative efforts in the specialized agreements was altered with our decision in early March to postpone three joint committee meetings involving high-ranking officials. We considered the meetings inappropriate in view of Soviet involvement in Angola. We also informed the Soviets we were not prepared to firm up dates for joint committee meetings which would normally take place this fall. The Soviets evidently understood the reasons for our decision. They indicated a readiness to reschedule meetings in November or later, and significantly have moved ahead on several long-stalled projects.

Increasingly, a number of US agencies responsible for implementing part or all of an agreement indicate they are encountering funding problems, since cooperative projects must compete for expertise and resources with other domestic programs.

Also, under several agreements, there appears to be increasing reluctance on the part of private industry to participate in cooperative activities because they believe there is not enough payoff technically, commercially, or because of the domestic criticism to which US-Soviet cooperation has been subjected of late.

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ENERGY

In connection with our decision to postpone three joint committee meetings, including the Energy meeting scheduled for March 15, we also informed the Soviets of our desire to continue working-level activity, noting that additional preparatory work could make the Joint Energy Committee meeting, when held, more productive. We presented to them a recapitulation of the status of all the Energy Agreement projects, actual and proposed, highlighting the many instances where we were waiting for Soviet responses to US initiatives as well as acknowledging cases where we owed them a reply.

The postponement of the Joint Committee meeting has delayed progress towards achieving US objectives under the Agreement. However, continued working-level activity has moved several projects closer to the point where we shall be able either to obtain technical benefits or to evaluate better the prospects for obtaining technical information of interest to us.

Energy Information and Forecasting

We sent to the Soviets an outline of the types of energy data related to production, consumption, and demand which we wish to exchange and the names of US coordinators for two proposed joint projects: forecasting methodologies and efficiency of fuel-energy use. They have not yet responded with comments on the outline or with the names of Soviet coordinators.

Electric Power

Thermal Power Stations: Arrangements were completed for a coal handling symposium and for the exchange of experts to view cycling operations (shut-downs and restarts of power plants). The Soviet cycling visit to the US has taken place and was regarded by both sides as satisfactory.

Hydropower: During a visit by a Soviet team to the United States, agreement was reached to look into problems of dam construction in seismic areas, a topic where the Soviets appear to have considerable experience which might be of help to us. The Soviets also revived their proposal to transfer the cold weather construction project from the Water Resources area of the S & T Agreement to the Hydropower Project of the Energy Agreement. It was agreed to refer this issue to the Joint Committees.

One of the few hydropower areas where we think we might benefit from cooperation is in cold weather operations. We have adopted a pragmatic stance, informing the Soviets that their response to our long-outstanding proposal for exchanges of long-term visits between their Permafrost Institute and our Cold Regions Research and Engineering Laboratory (CRREL) would be relevant to the jurisdictional issue. In April they responded positively to our long-term exchanges proposal.

Heat Rejection Systems: received during the quarter a Soviet letter sent in November 1975 (and learned of an earlier

letter which was never received) which contained proposals for meetings and for a program of joint cooperation. We have responded to the letter indicating that we are studying the Soviet proposals and will forward our answers to them shortly. We expect that the resumption of correspondence should result in increased activity.

Air Pollution from Thermal Power Plants: Arrangements were made for activities scheduled to take place in the second quarter: a symposium in the USSR on power particulate emissions and a Soviet delegation visit to the US on the subject of suppressing nitrous oxides in furnaces of boiler units. During the US delegation's visit to the USSR, both sides will discuss a Soviet proposal for a program of joint Soviet-American tests on an experimental industrial combined ash removal system.

Ultra High Voltage Transmission: A DC symposium was held in the USSR in April, during which the numerous issues for which we had been waiting for Soviet responses since February 1975 were all satisfactorily resolved. During the symposium the Soviets expressed an interest in obtaining US technology on underground cables, perhaps through a commercial purchase arrangement.

Electric Power Systems: US lack of interest in what the Soviets showed us during a 1975 visit to the USSR coupled with Soviet apparent lack of interest resulted in no activity in

this area for the quarter. Since neither side had completed the necessary preparatory work, a symposium scheduled for March did not take place.

Superconducting Transmission: We consider significant the initial steps taken by the Soviets to broaden their institutional participation in joint superconducting transmission activity. During the final quarter of 1975, the US side requested the broadening of the cooperation to include several key Soviet institutes in the superconducting power transmission field. In a March letter the Soviets informed us that the participation of two of the institutes we considered most important was now assured; a subsequent listing of joint experiments to take place in the USSR in 1976 included these two institutes as participating organizations. Assuming that the experiments go forward as scheduled at the new institutes, we will have achieved an advance as far as access is concerned.

During the quarter also, arrangements were completed for a two-week visit by two Soviets to Los Alamos for joint experiments on DC cables.

Magnetohydrodynamics: Cooperation proceeded smoothly, with fruitful meetings of groups on materials, magnets, and economic and technical aspects having taken place. The Soviet Materials group visited the " " in February and continued, with the US side, the detailed planning and implementation of current and anticipated materials designs test programs in

facilities of both countries. The Soviet Magnet group visited the US in March and both sides moved closer to final design specifications for the magnet which will be supplied to the Institute for High Temperatures by the US. The Working Group on Technical and Economic Aspects of MHD, which met in the USSR in March, adopted a schedule for the completion of publication of the status report on Technical and Economic Aspects of MHD.

Solar: A Soviet group visited the US for workshops on solar heating and cooling and on solar thermal power stations. During the workshops we learned much about the extensive design work done by the Soviets; the information we received may be of value in the design of the US experimental large central power station. US and Soviet solar experts signed a protocol on March 4, a section of which calls for the holding of a workshop on direct conversion of solar to electrical energy (photovoltaics) in the USSR before September 1976. We are presently discussing with the Soviets questions relating to setting definite dates and devising a satisfactory itinerary for this workshop on photovoltaics, an area which is particularly interesting to us because of Soviet claims of progress made.

Geothermal: We provided the Soviets with a technical justification to support our desire to send at least three experts to Kamchatka. They responded in mid-May stating that it is not possible to organize a visit to Kamchatka geothermal facilities in 1976. We have not identified any further initiatives in geothermal to take at this time.

Coal, Oil, and Gas

We have not yet received Soviet responses to specific US proposals for recommendations to the Joint Committee for oil and gas joint projects, and for pursuing coal cleaning activity under the Environmental rather than the Energy Agreement.

Environmental Aspects of Oil and Gas Operations

After almost two years of waiting, we finally received word of the designation of a Soviet project coordinator and a Soviet invitation for a visit to the USSR. We are now studying details of timing, itinerary, and make-up of a US delegation.

Soviet Bureaucracy

Soviet lines of authority no doubt account for their proposal to merge cold weather construction with hydropower. In their case, both come under the Ministry of Power.

US Administrative Problems

The US-initiated postponement of the Joint Committee has put off high-level decisions needed to start cooperative activity in energy information and forecasting, oil, and gas. Without the high-level meeting, US high-level pressure could not be brought directly to bear on other outstanding issues, and this may have slowed down resolution of geothermal and solar issues, for example. However, it may have contributed to expedited working-level activity for thermal power, UHV, and environmental aspects of oil and gas operations.

Private Sector

ERDA is letting contracts for various aspects of the channel which the US is to provide for cooperative MHD experiments and is seeking bids for the cryogenic refrigerator for the superconducting transmission project.

Upcoming Events

The US Executive Secretary will visit the USSR in June to review outstanding issues.

AGRICULTURE

The Soviets largely maintained an agreed schedule of supplying us economic data on agreed categories of recent historical figures for crop and livestock production and utilization, and on some food industry output. Contacts with Soviet institutions and individuals were further widened through team exchanges and there was additional exchange of agricultural research information and materials. More preparations were made for mutually beneficial research projects and we believe some Agribusiness visits contributed to market development for US agricultural commodities. On the whole, however, activities went through their usual seasonal slackening, plus this year more planning was required for the growing number of joint activities.

Agricultural Research and Technological Development

Activity was primarily in the Animal Science and Mechanization projects.

Under the Animal Science Project, two US veterinarians carried out separate research study visits in the Soviet Union. A final report and complete evaluation of the first, on foot-and-mouth disease, is being prepared. The second visit, on bovine leukemia, which began in late March and was not completed until the end of April, was on a first-time experimental receiving-side-pays basis. Considerable difficulty was encountered on our side in obtaining the necessary legal authority to initiate the visit. The receiving-side-pays arrangements also required much additional planning. Evaluation of the second visit has not been completed.

Some exchange of veterinary materials also was realized from these two visits, but was less extensive than we had hoped. Approval was obtained from USDA's Parent Committee on Foreign Pathogens and Vectors, which identified the veterinary materials that were eligible for this exchange. Agreement was reached in the Working Group meeting last October to exchange lists of such materials requested by each side by last February 1.

Our first veterinarian was permitted to bring back the USSR type A-22 foot-and-mouth disease virus, and a USSR strain of the avian virus with neutralizing antisera, but the desired Aujeszky's disease vaccine virus and ringworm vaccine (TF-130) were not given to him. We were unable to get a firm answer on these materials prior to his visit despite several inquiries. We have gotten rather mixed signals from the Soviets on this

matter and it appears that the Soviet working level is somewhat in the dark. In any event, we expect to discuss this matter at the next Working Group consultative meeting in June.

Our second veterinarian carried a bovine leukemia virus and antisera. A Soviet veterinarian now in the US will be given the following virus reference strains and corresponding neutralizing antisera and fluorescent antibody antisera for taking back to the USSR: Infectious Bovine Rhinotracheitis and Transmissible Gastroenteritis (TGE), Miller Strain, including swine testicular cell culture for use with TGE. The three viruses received by the US are now being tested, and attempts will be continued to obtain the other two materials through further exchange.

The Soviets unsuccessfully tried to get a written commitment from our first veterinarian concerning expanded US cooperation in foot and mouth disease. (Interestingly, this occurred about the time of an outbreak of this disease in the USSR which later apparently reached major proportions before reportedly being brought under control.) This tactic has been attempted on several of our past teams, even though proper procedure is for a new proposal to be put forward in a Working Group and then be recommended, if both sides agree, to the Joint Committee for final approval. This problem again will be discussed at the upcoming consultative meeting on June 10 and 11.

Under the Mechanization Project, a Soviet team was received near the end of the quarter--on farm machinery maintenance and methods of diagnostics. Previously there was considerable reluctance on the part of the industry hosts to receive this team, because the former felt that the Soviets wanted to get into matters of proprietary interests and that they could not go beyond what had been done for a similar team in 1974. They also felt that the USSR team members were not well enough qualified technically. The team was told at the start of the visit that each company host would be the sole judge of what was shown and discussed, since this is a private right under our system. Team members said that they understood this and indicated their satisfaction at the end of the visit. We were unable to send an escort with this team, and have not yet received any feedback comments from the US company hosts. The Soviets, however, seemed satisfied with their visit. They were warned beginning last October that there might be difficulty in getting industry cooperation for this team (which the companies felt should be a commercial visit), but they pressed hard and we finally were able to arrange the visit.

Agricultural Economic Research and Information

In the Agribusiness project, two USSR teams--the first on meat processing and utilization of slaughterhouse by-products and the second on milk production and marketing--were received in the usual fashion and were escorted. Both had high praise

for the arrangements and their experiences with them, including information received, and both visits eventually may help promote some US sales of equipment and/or technology used in these industries. Members of the second Soviet team gave disappointing answers to US questions about their corresponding industry, either because they were not really specialists or were not willing to say much. The Soviets did promise to send answers to some questions later.

A US team on Forecasting planned for this quarter had to be postponed because arrangements to include some US university personnel could not be completed in time. Agreement has not yet been reached on a new time later this year.

Soviet Bureaucracy

Shortly after the end of the quarter, the Soviets informed us of the immediate replacement of Mr. G. P. Rudenko as the leader of the USSR side of the Working Group on Agricultural Economic Research and Information. The only reason given was that Mr. Rudenko is moving to a different job. Previously he was a Deputy Chief of the Agricultural Division in the USSR State Planning Commission (Gosplan). His replacement as Soviet leader is Mr. A. I. Monov, also in Gosplan, Head of the Section on Crop Farming in the Agricultural Division.

We have not known Monov previously but note that his rank apparently is lower, and have been told that his specialty is more narrow, as compared to Rudenko in his previous job. Our

Working Group leader will first meet Mr. Monov at the consultative meeting on June 8 and 9.

The Soviets again raised several programming questions which we had understood were settled. Most of these related to new activities which they originally requested, but which our scientists found to be of insufficient interest or priority. When this happens, we usually do not know whether or not the Soviets misunderstood our stated decision or if by raising the matter again they are hoping that we might change our minds.

Soviet response to agreed deadlines for submitting requested programs for USSR teams coming to the US, and for reacting to requested programs for US teams going to the Soviet Union, improved somewhat during the quarter. On the other hand, the Soviets were about a month late in proposing the exact dates for their team visits to the US, and about two months late in providing their list of veterinary materials that they are requesting from the US and in responding to our proposed dates for the upcoming consultative meetings of the Working Groups. For the one on Economic Research and Information, the Soviets belatedly tried to move up the date. Because the schedules of our participants were already set, however, they responded to our urgings and finally agreed to the proposed dates.

Several changes had to be made by each side in the scheduling by months of the 1976 teams agreed to last October. However,

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these changes have not affected progress with the Agreement, nor are they expected to during the remainder of the year.

US Administrative Problems

The slow movement of diplomatic pouches between Washington and Moscow continued to be a handicap. Outgoing pouches often were significantly slower than the incoming ones. This meant that again too much information had to be transmitted by telegram.

Funding continued to be a very important problem, especially for travel, but as usual was of less importance than it will be in the second quarter when exchanges intensify. Since there has been no separate budgeting for Agreement activities, the required funding for the Agreement has had to be taken away from regular activities in a period of tight budgets and rising costs.

Private Sector

There were no new significant developments involving the private sector during the period under review. USDA has noted, however, that US companies asked to host Soviet teams have been raising more questions this year than in the past about the reasons for and value of such activities.

Upcoming Events

More teams are scheduled to be exchanged during the second three months of the year than was the case in the first quarter. Of greatest importance will be the consultative meetings of the two Working Groups, June 8 and 9 for Economic Research and

Information, and June 10 and 11 for Research and Technology, both in Moscow. With respect to the next Joint Committee meeting, due to be held in Washington, the Soviets already have indicated several times that they would like for it to be held in September.

WORLD OCEANS

US Executive Secretary Donald Martineau met during his March visit to Moscow with Academician Aleksandr Sidorenko, USSR Co-Chairmen of the Oceans Agreement, and other responsible oceanography officials to discuss developments since the second Joint US-USSR Committee meeting, arrangements for the third Joint Committee meeting, and problem areas. His visit and the several working group meetings which followed in the second quarter resulted in a definite surge forward toward overcoming the "newness" of the Agreement and toward identifying and planning for joint cooperative projects.

Large-Scale Ocean-Atmosphere Interaction

Martineau held discussions during his Moscow visit with Dr. E. I. Tolstikov, Deputy Director of the Hydrometeorological Service, to determine the seriousness of Soviet commitment in this area. Two letters sent during the last quarter to Dr. Tolstikov by the US Chairman of the Working Group for this area had gone unanswered. Martineau learned from Tolstikov that the Soviet interest was not flagging in either the North Pacific

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Experiment (NORPAX) or International Southern Oceans (ISOS) projects.

As to NORPAX, Tolstikov indicated that the USSR is considering naming a representative from the Academy of Sciences' Far Eastern branch to participate as leader from the Soviet side and that a definite proposal on this project will be made at the third Joint Committee meeting. As far as ISOS is concerned, Tolstikov assured Martineau that a member of the Arctic Institute had been named as Soviet Working Group Chairman, and that the Soviets would host a workshop in August. Tolstikov also agreed, in principle, that US scientists writing up their portion of a joint paper on a cooperative effort in the Drake Passage in 1975 should have access to original Soviet data.

Martineau also raised with Tolstikov the matter of the proposed Indian Ocean Monsoon Experiment (INDEX), to be carried out as part of the international Global Atmospheric Research Program (GARP). Tolstokov advised Martineau that the Soviets will lay out their program (known as Monsoon '77) proposals at an international meeting and will invite US and third country participation.

US and Soviet INDEX scientists have yet to meet as a working group, with both sides having agreed to carry INDEX cooperation in a multilateral context.

Geology, Geophysics, and Geochemistry

During Martineau's visit the Soviets asked to defer discussions of outstanding program-related issues in this area

until the May Working Group meeting. They proposed instead for US approval that A. V. Sidorenko, new Chairman of the Soviet side of the Joint Committee, attend the Working Group meeting and that an extensive tour of US oceanographic facilities be arranged for his and the delegation's benefit. The US side, anxious to save some interesting sites for use as leverage in bargaining for inclusion of Soviet sites in the Pacific Far East in conjunction with a future Joint Committee meeting, agreed to a scaled-down itinerary, explaining that it would be impossible to arrange such an extensive itinerary at such a late date.

Ocean Currents and Dynamics

A number of long-outstanding issues of importance relating to the carrying forward of the POLYMODE project (POLYMODE refers to Mid-Ocean dynamics experiments) have been the subject of intense discussion via correspondence between US and Soviet counterparts at several meetings in the February-April time period: US proposals for third country participation in POLYMODE and for establishing teletype communications between and assigning liaison scientists at POLYMODE scientific centers in the two countries; and a Soviet proposal for a change in locus of investigation under POLYMODE.

US POLYMODE scientists are frustrated by the Soviet bureaucratic inability to translate working-level agreements into actual implementation. They maintain that third country participation, as provided for in the working-level agreement, would

be valuable to POLYMODE and feel strongly that, as instrument deployment dates approach requiring an even more effective exchange of planning information, only a teletype link between and the presence of informed liaison scientists representing their POLYMODE programs in the US and Soviet POLYMODE centers, can assure prompt, well-informed, direct communications between scientists of both nations.

The Soviets stated in a February meeting that they wished to change the locus of investigation under POLYMODE. Both sides had agreed perviously to carry out their eddy measurements in the North Equatorial Current. The Shirshov Institute of Oceanology, which runs the Soviet POLYMODE program, says now that it has a greater interest in and is switching the emphasis of its program to measurements of the ring phenomenon in the Gulf Stream Extension System. The ring phenomenon--formation of rings of water possessing significantly differing temperatures--is presently coming under much more international scrutiny for a variety of important scientific reasons. US and Soviet POLYMODE scientists will give further attention to the subject of experiment location at an April planning meeting.

Data Exchange

A joint meeting of US-USSR experts on Data Exchange took place in Washington from March 29-April 2, 1976. The Soviets acceded to the US proposals that all data emanating from US-USSR joint cooperation be exchanged via magnetic tape between national

data centers. They also agreed to consider a US proposal for the establishment of a standing working group on data which would coordinate all exchanges of data taking place at the project level.

Biological Productivity and Biochemistry

In this program area the US side has come to realize that the five-year program of cooperative activity agreed upon by the Working Group and approved at the Joint Committee level was so ambitious as to be impractical from an organizational and budgetary standpoint. As a result, progress to date has been very slow. Both sides are eager to have real accomplishments to their credit before the Agreement term runs out; therefore, at the May Working Group meeting, the US and Soviet members will re-examine the draft program with a view toward assigning priorities to the proposals contained therein and establishing realistic goals for the '76-'77 period.

During Martineau's March visit, the Soviets expressed interest in cooperation in training of dolphins/porpoises and an exchange of mobile exhibits in biological and fisheries research. These subjects were to be discussed at the May Working Group meeting.

Soviet Bureaucracy

Soviet bureaucratic difficulties seem to be impeding resolution of the teletype, liaison scientists, and third party participation issues under POLYMODE. Agreement was reached on the working level as early as 1974 on these matters. By the

1975 Joint Committee meeting these exchanges were written into the Protocol and had received the bureaucratic blessing of the late Soviet Joint Committee Chairman Vinogradov, but still no action. Upon Vinogradov's death, negotiations on implementation of these exchanges have been initiated with his replacement on the Joint Committee, Academician A. V. Sidorenko.

Soviet working-level scientists are in agreement with their US counterparts on the importance of these exchanges, but thus far a go-ahead has not been given by appropriate segments of the bureaucracy. Soviet scientists say that the teletype issue is hung up in the Ministry of Communications, and that the Shirshov Institute has difficulty in naming a liaison scientist who, in effect, would be delegated the responsibility of speaking for the Soviet POLYMODE program. Soviet POLYMODE scientists also explained that they have difficulties bringing third parties in at this stage of the project, but have made the suggestion that third parties might participate in meetings in the USSR if included as part of the US delegation. Soviet working-level scientists have indicated that a positive stance on these matters by Sidorenko could lead to their resolution.

US Administrative Problems

Each US lead agency having responsibility for supporting an element of the Oceans Agreement has been caught up in funding problems. In order to meet financial difficulties, the US side

of the Joint Committee believes that proposed schedules of specific activities and assignment of resources, such as vessels, generally should be limited to a one- to two-year period, rather than the five-year period favored by the Soviets. Therefore, we are recommending against long-range planning, suggesting instead to our program area representatives that new initiatives be made contingent upon progress achieved under ongoing programs. Working Groups of Experts are meeting jointly in the second quarter and the next to develop agreeable plans for effective cooperation for the projects the US-USSR Joint Committee will review at the third Joint Committee meeting planned late in 1976.

Upcoming Events

Planning for the third session of the Joint Committee will be a major item for review, and the US has indicated that a time for this meeting would depend on the availability of our new Committee members.

Prior to the third session of the Joint Committee meeting, both sides will give further consideration to the post-meeting tours for the third session and fourth Joint Committee meetings. The US Committee members are interested in visiting Far Eastern facilities and in return are prepared to arrange for a West Coast tour for Soviet Committee members.

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HOUSING AND OTHER CONSTRUCTION

There were significant activities under only two of the six working groups of this Agreement.

New Towns

The New Towns Working Group held its first meeting in February when a US delegation visited the Soviet Union. The major result of this exchange to date is the establishment of a personal and organizational dialogue between new towns experts of the two countries. Virtually all members of the US delegation came away with the feeling that the Soviets have a large reserve of goodwill and that there is something to build upon in improving cooperation.

The Working Group negotiated a two-year program for an exchange of visits and documents. The US side proposed an exchange of new town specialists for an in-depth study of each other's new towns lasting several months. The Soviet side was not prepared to agree to such an exchange at this time, since it must first obtain approval from higher authorities. The major event of this meeting, however, was the submission of the American portion of a US-USSR joint publication on standards and criteria for site selection and development of new towns. The US draft, 289 pages long, represented a major effort. The Soviets, however, turned in less than 50 pages. This lack of comparability was an embarrassment to them and it was agreed that the Soviets would complete a fuller work by June 1976 for the final joint publication.

For the first time the Soviets reciprocated the large number of documents on new communities given to them during a 1974 visit by a US team on new towns, which was then a project under the Environmental Agreement. During the meeting, they provided some 29 documents on new communities and related topics. These documents have not yet been translated and their significance is uncertain. However, judging from previous books and other materials reviewed, Soviet publications deal primarily with "ideal" prototypes, not with reality. Although these publications contain statistical data, they would be much more useful if they contained a better and more complete description of real projects, including evaluations of strengths and weaknesses.

Hard data or evaluations of the new towns are very difficult to obtain from the Soviets. The US team was not successful in obtaining maps or plans of the new towns except in the idealized or schematic forms typical of Soviet cities. A member of the US delegation has prepared a chapter on Soviet new towns in a forthcoming book, but the best sources for this work were not the Soviet materials received in 1974 but the works of American scholars who had studied the Soviet press and other sources for years and had written books and articles on related fields such as Soviet housing, town governance, geography, and industrial development. The basic problem seems to be not so much withholding of documents for security reasons, but the

lack of candid and thorough Soviet professional writing in this field. Government publications on new towns are generally so bland and watered down that they do not provide the same insights as do official and unofficial American publications.

So far there has been only one restriction of access: the American team suggested a visit to Karaganda and the nearby mining towns as examples of "energy new towns". The Soviets did not comply with this request because Karaganda is in a restricted area, but they substituted Donetsk in the Don Basin, which served American purposes equally well. The Soviet itinerary was excellent in terms of giving the US delegation a feel for what Soviet new towns are like, but the study tour did not make up for the lack of documentation and time for an in-depth study.

Industrialized Building Systems and Utilities

The Working Group on Industrialized Systems and Utilities held its first meeting in March when a Soviet delegation visited the US. The working group developed a modest number of projects extending over a reasonable period of time, holding the cost and manpower required by both sides during the first year to an acceptable level.

The agreed sub-projects in the area of Industrialized Buildings include: the architectural/engineering design of building systems and components; the industrial engineering factory processes for production; rehabilitation methods for existing residential, industrial, and community buildings; and

the design and construction of large reservoirs, smoke stacks, cooling towers, and silos. In the area of Utility Systems the sub-projects include: internal systems for building utilities and energy conservation; utility systems on a community basis for populated areas; closed loop liquid waste systems for small and medium-sized communities; and pneumatic transport systems for collection and removal of domestic waste. Since this was the first meeting of the working group, it is too early to assess the potential significance to the US of any of these projects from a technological, commercial, or informational point of view, until sub-project groups are established and have an opportunity to meet.

At the working group meeting the US side gave 13 technical documents to the Soviet delegation and in return a smaller number of technical documents was received from the Soviet delegation. During the study tour the Soviets received an additional 14 documents from US companies and trade associations. So at present the US side has far exceeded the Soviets in the number of technical documents exchanged. Furthermore, in terms of quality, the documents submitted by the Soviets were very basic, easily obtainable, in some cases not appropriate to the topic, generally not up to the technical quality of those submitted by the US side, and included nothing in the utilities field.

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During the second quarter of 1976, the working group will devise mechanisms to establish the eight sub-project committees which will exchange personnel between the two countries during the third quarter of 1976. The second quarter of 1976 will thus be very important, for the success of this working group could well rest on the progress toward involving the private sector intimately in its activities. During the fourth quarter of 1976, exchange visits will be made in the project area of internal systems for utilities and energy conservation and in the project area of utility systems for populated areas.

Soviet Bureaucracy

Problems with the Soviet bureaucracy stem from its compartmentalization and hierarchy, which make it difficult for Soviet officials to deviate from a traditional way of doing business and to cross jurisdictional lines to obtain insights on new towns from different perspectives. These factors made it difficult to obtain agreement on long-term exchanges to study the Soviet new towns program in detail and to obtain financial and economic information on the new towns where responsibility lies outside the State Committee for Construction.

US Administrative Problems

Every member of the US new towns delegation had a specialty related to the working group. It is expected that the members of this team will retain their interest in the Soviet Union and will be available for future exchange assignments. The

project requires one-half of a man-year of a senior new towns specialist and comparable amount of time of a secretary.

The core problem on the American side is the uncertainty or outright absence of funding support for some aspects of the exchange. Funds for implementing the "receiving side pays" part of the Agreement have not yet been clearly earmarked by the various program areas involved, although top staff is aware of the budgetary requirements. Funds for translation are limited. Representational funds are non-existent, except perhaps at the Secretarial level, forcing HUD employees to entertain at their own expense or to request assistance from the private sector or state and local governments. Limitations on travel funds restrict the number of professional HUD staff who can participate in the exchange on a continuing basis. These problems are being addressed, but no satisfactory solution has been found.

In the Industrialized Building Systems and Utilities area, there will be very difficult administrative problems to overcome. The US team found that the funding arrangements placed it in a position whereby it was obliged to use all reasonable and honorable methods to persuade the private sector to host the Soviet delegation to as many dinners and other activities as possible. An item as simple as private transportation had to be provided by the American working group members, principally those from HUD. The program office in HUD responsible for this working group is not staffed or prepared to engage in

extensive activities of this type without sufficient financial and manpower resources which will be strained eventually as the working group implements the eight individual sub-projects currently planned. Additional resources will have to be found, but it is not yet clear where or how this can be done.

Private Sector

The reaction of the private sector to the Industrialized Building Systems Working Group was surprisingly cold. Some 65 personal letters were sent to the major trade and professional associations and selected companies soliciting their comments and assistance. Half did not respond and only a handful of the rest indicated any degree of interest. It appears that past activities between the US private sector and the Soviets have so disillusioned our private sector that there may be a real problem in bringing it into the various sub-projects, especially when it will be required to expend unreimbursed manpower and travel funds. However, private industry participation is absolutely necessary, since the bulk of the technical activities in which the working group will be engaged are not in the domain of the Federal Government in general nor of HUD in particular in such fields as design, construction, and process engineering. If the private sector does not participate, the exchange program in this field will most likely have to be reduced to levels below Soviet expectations.

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Upcoming Events

During the second quarter of 1976, a Soviet project-level team is expected to come to the US on a new towns tour. An exchange and discussion of additional drafts on the joint publication is one of the goals to be accomplished.

Other working groups in the Agreement will have meetings late in the second quarter.

ENVIRONMENTAL PROTECTION

Within EPA an extensive review was held of all EPA project activities to assess their substantive merit and to consider which should be terminated, modified, placed on "probation", or continued beyond the May 1977 renewal date. No decisions have yet been made.

The US Executive Secretary conducted a mid-year review in Moscow during May. Originally, EPA Administrator Train had planned to conduct the review, but in the wake of postponements of Joint Committee meetings involving Cabinet-level participants, the level of US representation was lowered to that of Executive Secretary. The review went well, but the Soviets used the occasion to press for a specific date for the next Joint Committee meeting tentatively set for fall of this year. We indicated we were not able to agree yet to firm dates.

As was the case in previous years, working-level activities in the first quarter were relatively quiescent but began to pick up in March.

Air Pollution

During March under the Particulate Abatement Technology Project, Soviet teams participated in joint testing of a US electrostatic precipitator with US and Soviet instruments. A joint test of a US wet scrubber which had been agreed upon was cancelled when a US firm backed out because of concern over its proprietary interests. We now plan to perform the tests in the USSR.

Soviet cement experts toured air pollution control facilities of US cement industries March 9-21, also under the Particulate Abatement Technology Project. Our side reports the trip opened sales possibilities for US control equipment.

A US team in the Process Improvement and Modification Project visited Soviet iron and steel air pollution facilities in March-April. Although the visit was otherwise successful, the Soviets again failed to program a visit to the world's biggest iron and steel complex at Magnitogorsk. We raised this issue at the mid-year review in May and received Soviet assurances that henceforth our delegations would have access to Magnitogorsk.

Water Pollution

In the Water Pollution from Industrial Sources Project, a Soviet iron and steel delegation visited waste water facilities of several US plants in January. As in several other projects where EPA is the lead US agency, the US side postponed a waste

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water treatment symposium from May until after July 1, because of temporary budgetary limitations through June 30.

Agricultural Pollution

Activity in this area was minimal but agreement was reached for potentially useful reciprocal visits later this year under each of the four projects: Integrated Pest Management, Interaction Between Forests; Plants, and Pollutants; Forms and Mechanisms by Which Pesticides and Chemicals are Transported; and Effects of Chemicals Used in Agriculture on Fauna.

Urban Environment

US experts on urban transportation under the Environment in Existing Cities Project visited several Soviet cities in January, and proposals for a few other exchanges on urban environment later this year were developed. Otherwise, activity in this area was minimal.

Nature Protection and Preserves

Even more so than in other areas, activity in this area usually peaks in the summer and autumn. Plans for extensive activity under the Northern Ecosystems Project were temporarily set back by the heart attack of the Soviet project leader. Nevertheless, the long-awaited first exchange visits of experts on environmental problems of pipeline construction in permafrost areas (set for June 4-18), of strip mining as well as other follow-up visits on other northern ecosystem activities, seem to be on track.

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The Soviets also developed what appears to be an excellent program and itinerary for the first US-USSR symposium under the Biosphere Reserves Project in the USSR in May. Taking cognizance of the relationship between this project and UNESCO's Man and the Biosphere Program, the Soviets invited a UNESCO observer.

Under the Marine Mammals Project, a Soviet sealer/trawler picked up three US seal/walrus specialists at Dutch Harbor, Alaska, on March 12 for a ten-week joint research cruise. Curiously, the Soviets insisted that the ship not dock but remain outside the inner harbor to receive our people by small boat. They may have been worried about a possible future US request for reciprocity in berthing a US vessel in a remote Soviet Far Eastern port.

Marine Environment

Our project on Effects of Pollutants on Marine Organisms, which has always suffered from lack of adequate Soviet preparation and communication, received another setback in March when the Soviets insisted that the location of a symposium be shifted from the previously agreed location, Puerto Rico. Although no reason was given, the Soviets apparently wished to avoid possible embarrassment with Cubans, who were expected to push an anti-US resolution on Puerto Rico in the UN. We responded by canceling the symposium. In the wake of this and other frustrations stemming from poor Soviet performance in administering their side of this exchange, the US project leader resigned.

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We are putting the Soviet side on notice that the next twelve months are "make or break" for this project.

Biological and Genetic Effects

Three US specialists participated just after the quarter closed in a successful workshop on Basic and Practical Approaches to Environmental Mutagenesis and Carcinogenesis in Dushanbe (Tadzhikistan) April 1-10 under the Biological and Genetic Effects of Pollutants Project. The Soviets agreed to receive a US team under this project in May to discuss for the first time occupational and environmental health problems of oil shale processing--a subject of growing interest in our quest for developing energy sources.

Climatic Effects

The Soviets are more active in this area than any other country, and their theoretical work combined with our computerized techniques for data manipulation are helping both sides to devise indices which better define the sun's effect on climate.

We have proposed discussions and add-ons to future stratospheric balloon experiments under the Pollution and Climate Project so as to involve the Soviets in work on studying the influence of fluorocarbons on depletion of the ozone layer.

Earthquake Prediction

One of the best project areas under the Agreement has been set back by an unexplained interruption in the provision

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of seismic data from the Nurek Reservoir (Tadzhikistan) since last November. We hope the problem is merely logistical rather than a calculated Soviet decision to cut off or slow down the flow of important data. On the US side, we face serious budgetary limitations in this, one of the most outstanding and productive areas of environmental cooperation.

Private Sector

Following a 1974 meeting (arranged through the US Coast Guard participants in the Environmental Agreement) between Samson Cordage Works of Boston, Massachusetts, and a Soviet delegation and a subsequent 1975 visit to the USSR by company representatives, Soviet officials signed in January 1976 a contract for \$1.25 million for open-sea-skimming units with a 1,000 gallon per minute pumping capacity for clearing oil spills.

Under the terms of the Joint Committee Memorandum of October 31, 1975, the Department of Commerce held in Moscow, February 2-5, a highly successful "mini" sales seminar/exhibit (Clean Air '76) of air pollution monitoring and analysis equipment. Seven US firms participating in the exhibit (Beckman Instruments, Inc.; Hewlett-Packard; Meloy Laboratories; Monitor Laboratories; Rockwell International; Anatole J. Sipin Co., Inc.; and Thermo Electron Corp.) sold \$160,897 worth of equipment off the floor and the exhibitors project \$3.89 million of additional sales over the next twelve months.

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The outstanding sales results of our "Clean Air '76" exhibit and our excellent working relationship with a principal Soviet end-user (the USSR Hydrometeorological Service, the chief of which is Train's counterpart under the Agreement) lead us to believe that US firms specializing in water pollution monitoring and analysis equipment can achieve comparable sales success in a similar Department of Commerce exhibit/seminar to be held at Soviet request in Moscow next year.

We believe these developments demonstrate how carefully selected and prepared activities under the Agreement can open and develop Soviet (and as a consequence perhaps other Eastern European) markets for environmental equipment. In sum, for a very modest expenditure of USG funds, we have already netted US firms sales of \$1.4 million and opportunities for sales of approximately another \$4 million over the next twelve months.

SPACE

Soviet Academy of Sciences President Aleksandrov informed NASA Administrator Fletcher in February that the Soviet side requires further intensive preparation for a NASA-Soviet Academy meeting on post-ASTP cooperation and will inform us when ready. This may well represent further Soviet stalling in an area we consider important. At the same time, in his letter to Fletcher, Aleksandrov confirmed Academy agreement with the importance of large (visible) projects, similar to ASTP, for NASA-Soviet Academy cooperation.

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It is possible that changes in Academy leadership and the 25th Party Congress involving the participation of the top space officials delayed Soviet preparations for the meeting to define post-ASTP large space projects. It is also possible that the delay reflects a post-Party Congress, high-level rethinking of Soviet domestic space program priorities and, perhaps, a post-ASTP assessment of benefits accruing to the USSR from participation with the US in highly-visible projects. In any event all informal and formal indications point to continued Soviet interest in future US-USSR manned space flight cooperation and to a joint meeting at some time in the not-too-distant future.

While the ASTP project proved out compatible docking systems and joint mission operations, thereby laying a basis for future joint manned flight operations with the Soviets, we cannot know what future collaboration is likely until the discussions on post-ASTP cooperation are held.

With regard to access to the scientific results of the Soviet space program, Soviet exchange of data has been generally adequate (quantity, quality, deadlines) in this period, with the exception of the Soviet response to our suggestion for a meeting on Venera results as described below.

Technical benefits from US-USSR space cooperation accrued during the quarter and after to the US. We received Soviet ground truth for a test site near Kursk applicable to the Large

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Area Crop Inventory Experiment (LACIE), and a new flight opportunity on the Soviet biological satellite. Neither technical benefit would have been immediately available outside of the US-USSR bilateral context.

Space Biology and Medicine

The US biological materials and radiation dosimeters flown on the Soviet biological satellite (Cosmos 782), which was recovered on December 15, 1975, were returned in good condition to US investigators for analysis. US specialists also received Soviet flight tissue for study. In general, US scientists felt that the Cosmos flight 782 yielded useful data on the effects of zero gravity on the embryonic development of simple plants and animals and radiation measurements in an orbit not flown by the US at a time of minimum solar and maximum cosmic ray activity. In addition, informal agreement (to be confirmed at a September working group meeting) has been reached to fly five US biological experiments on the next Soviet biological satellite, anticipated in the fall of 1977. As on Cosmos 782, this mission will provide flight opportunities not otherwise available to us.

Space Science

Coordinated magnetometer observations by the NASA Applications Technology Satellite (A. - 6 and Soviet ground stations continued. This project has as its scientific objective correlating Soviet ground magnetometer data with magnetometer data

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taken by the satellite's magnetometer in order to learn more about the effect of the sun on the earth's magnetosphere. Adjustments were made to Soviet ground stations to improve signal strength and quality in order to bring the data being sent to the satellite up to the level needed to meet experiment scientific objectives. Sample processed US data tapes were provided to the Soviet experimenters to allow them to check out their computer programs for data analysis. Full production runs of processed data tapes combining both ground and spacecraft magnetometer data are expected to begin during the third quarter of 1976. Both US and Soviet experimenters will analyze these data.

A disappointing development as regards data exchange in the Space Science area was the Soviet failure to agree to a bilateral meeting of specialists before the international COSPAR meeting to discuss the results of the Venera 9 and 10 missions and of recent US radar observations of the Venusian surface. It had been hoped that the now more relaxed attitude of Soviet scientists would permit such an exchange, but Soviet difficulties and disagreement in the interpretation of their own data apparently delayed them.

Natural Environment

Both sides continued to exchange agreed materials in anticipation of the May 24-28 working group meeting at the Goddard Space Flight Center (GSFC). The exchanges are proceeding in

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in a satisfactory manner in the areas of microwave techniques, oceanology, agriculture, atmospheric effects, and geology. In addition, a Soviet scientist has proposed a follow-on to ship satellite measurements of sea-surface temperature in the Arabian Sea, an exercise to determine the utility and accuracy of a remote sensing satellite in measuring sea-surface temperature. NASA and NOAA are agreeable to such an experiment subject to Soviet Academy endorsement.

Satellite Meteorology

Both sides have exchanged materials looking toward joint experiments in the atmospheric temperature sensing and microwave sensing areas. The exchange is back on track after earlier transmittal problems (see discussion of US administrative problems).

Rocket Meteorology

Materials have been exchanged in anticipation of a joint study of diurnal (daily) variations of atmospheric parameters under different geomagnetic conditions, expected in the July-August 1976 period. In addition, both sides are considering a rocket intercomparison test in 1977 and preparation of a joint upper air analysis atlas.

Soviet Bureaucracy

NASA has not felt certain that the Vice Chairman of the Interkosmos Council (who acts in an executive secretary capacity for the Space Agreement) has always acted as an effective

conduit in referring important bilateral space communications to the top Soviet substantive level. The possibility thus that senior-level exchanges on a post-ASTP meeting might not be receiving top-level Soviet attention prompted a somewhat pointed Fletcher to Aleksandrov letter. The result was rapid response which affirmed continuing Soviet interest but further delayed a meeting.

US Administrative Problems

NASA learned in this quarter that Soviet materials, particularly in the space meteorology area, which NASA had taxed the Soviets for failing to send on, had apparently been delivered to the US Embassy in Moscow, then either not forwarded or lost in transmission. This communications problem has been corrected and we see the results in faster delivery of correspondence.

Private Sector

While no activities take place between private US firms and Soviet institutions under the Space Agreement, the Soviets have approached several US firms for the purchase of equipment used in earth resources survey programs. The digital multispectral scanner approved last year by Commerce for export to the Soviet Hydromet Service was not cleared by COCOM. DOD and Commerce are still reviewing the case. Stanford Technology Corporation has been given a negative advisory opinion from Commerce concerning the exportability of a computer-controlled image processing system for the Institute of Space Research in Moscow. Stanford has not yet proceeded with a formal license request.

Second Quarter/Upcoming Events

Two Soviet scientists met with their US counterparts in connection with the preparation of the final report on the joint ASTP multipurpose furnace experiment, April 13-14, at the Marshall Space Flight Center, Huntsville, Alabama. The final reports containing evaluation of test results are now being written.

The US co-chairman of the Working Group on Intellectual Property requested a NASA briefing on April 16, 1976 for the Soviet delegation on the NASA monetary award system for scientific and technical contributions.

In April, a meeting to discuss preliminary scientific results from the experiments flown aboard the Cosmos 782 took place in Moscow, attended by two NASA scientists.

A meeting of the Joint Working Group on the Natural Environment took place May 24-28, 1976, at Goddard Space Flight Center (GSFC), Greenbelt, Maryland.

Soviet scientists have been invited to GSFC for a two-week period beginning May 24, 1976 for joint analysis of Soviet Mars gamma-ray spectrometer data.

In June, US and Soviet specialists discussed results of Venera-9 and -10 missions and of US radar observations of Venus at the time of the COSPAR meeting.

NASA invited Soviets to hold bilateral meetings at satellite and rocket meteorology areas at the time of the COSPAR meeting in June.

We have responded positively to a Soviet proposal for a meeting of specialists to produce a scientific article on the results of the joint ASTP ultra-violet absorption experiment, with an exact date yet to be agreed.

The Space Biology and Medicine Working Group meeting will take place in Yerevan, Armenia, USSR, during the last part of September/first part of October, 1976.

TRANSPORTATION

There was significant activity in four areas under the Agreement.

Automobile Transport

First Deputy Minister Shumilin of the Soviet Ministry of Internal Affairs completed a multi-city visit of the United States in March, which achieved its purpose of exposing him to US technology in the field of automobile traffic safety. During the visit the Soviets submitted their plan for testing a US device which prevents a sub-par driver from starting his vehicle. The Soviet plan meets our criteria for proving or disproving the efficacy of the device. We expect to begin actual testing before the end of 1976. In the meantime, the device is being modified slightly in order to make it compatible with Soviet vehicles.

Rail Transport

The agreed exchange of rail hardware (US draft gear for Soviet concrete ties) took place in January and February with

ceremonies and press coverage. The Soviets provided all transportation, including the cost of inland US transportation for the concrete ties to Chicago, the testing site. Private sector involvement made this exchange of hardware possible. The Association of American Railways is now testing the concrete ties, but no conclusive results are available yet. Cardwell-Westernhouse firm of Chicago provided the draft gear which the Soviets will test.

The Soviet Rail Ministry submitted a proposal for the joint testing of US-manufactured roller-bearing axles equipped with a Soviet-developed elastic element designed to increase the service life of the bearing used in the axles of railroad cars subject to heavy dynamic loads. The US side is awaiting additional details before responding to the proposal. The Soviet proposal contemplates the participation of a leading US bearing manufacturer.

Marine Transport

US communications equipment for the selective calling of merchant ships at sea was tested on a Soviet ship as planned in January. Soviet and US experts met in New York in February to review results of the selective calling equipment tests. The Soviets indicated then that they thought the US system needed improvement before it would support it as the world standard. The Soviets later reversed themselves and now plan to support the system in the International Radio Consultative

Committee of the International Telecommunications Union as the world standard.

A three-man Soviet delegation underwent six weeks of marine terminal operations training in New York, San Francisco, Los Angeles, and Houston during January and February. The Soviets achieved their purpose of gaining exposure to actual US port operations involving the most modern aspects of our shipping: container ships, trailer ships, and barge ships. Financial constraints have thus far prevented the US side from organizing a team to the Soviet Union for a similar period of training, although the Soviets have proposed such a return visit.

Civil Aviation

Due to cooperation under the Microwave Landing Systems (MLS) Project, substantial progress has been made in gaining acceptance of US Time Reference Scanning Beam (TRSB) microwave (non-visual) landing system as the world standard by the strong support of this system by Soviet experts during the February meeting of ICAO's All Weather Operations Panel (AWOP) Working Group A (WG-A).

The Soviets have been actively promoting cooperation in all project areas by proposing meetings for the third quarter, submitting overdue reports and pressing for an early meeting between the new Soviet working group leader and his US counterpart to review cooperative activity and plan the 1977 program. The US working group leader wishes to hold the meeting in

conjunction with the next Joint Committee meeting, since an FAA staff review now in progress indicates that FAA may recommend severe cutbacks in civil aviation cooperation.

In a development related to the Air Traffic Control (ATC) project, the Swedish firm STANSAAB has approached the Department of Commerce for the licensing of the US components for the ATC system purchased by the Soviet Civil Aviation Ministry. FAA, on behalf of the Department of Transportation and with private sector concurrence, is objecting to licensing action which would assist STANSAAB because of the potential military benefits involved in this technology transfer. Sperry-Univac, the unsuccessful US bidder, is still in contact with the Ministry of Civil Aviation where dissatisfaction has been expressed at the technical level concerning STANSAAB's slowness in fulfilling its ATC contract.

US Administrative Problems

The Department of Transportation through its Executive Secretary has repeatedly pointed out the need for (a) funding support of the cooperative effort and (b) reiteration, if the Administration still considers it an important effort, of high-level support for it. The private sector is less eager to participate as hosts in the visits of Soviet delegations principally because of the domestic debate over our policy toward the Soviet Union. The view from the Department of Transportation is that the program was stimulated primarily for

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foreign policy reasons and the participating agencies are being increasingly asked to justify their involvement in the program solely on a technical payoff basis.

With the exception of rail metallurgy and electrification, there is no known technical benefit derivable from the Transportation Agreement that could not be obtained through the approximately twenty other cooperative arrangements maintained by the Department of Transportation with other industrialized, including socialist, countries. Cooperative activity under the Agreement has resulted in benefits from coordinating activity in international fora (ICAO and IMCO) and may result in large-scale sales of US technology and equipment.

Some benefits from cooperative activity are being realized in the railroad, highway safety, civil aviation, and maritime areas. In both the Civil Aviation and Maritime areas, there are several non-payoff areas that should probably be dropped. Similarly, little is expected from the urban transportation, transport of the future, and trade documentation facilitation areas. Transport construction has the potential for high payoff, but heavy involvement of the US working group leaders in other activities has made progress difficult.

SCIENCE AND TECHNOLOGY

Through Embassy Moscow we informed the Soviets that it would be inappropriate now to make definite plans for scheduling the Joint Science and Technology Working Group for the fall

of 1976. This was in the context of our having postponed other high-level meetings with the Soviets to signal our displeasure with their intervention in Angola. At the working level, however, good progress was made, especially in the areas of Application of Computers to Management, Electrometallurgy, Intellectual Property, and Science Policy.

Application of Computers to Management

Serious obstacles to implementing cooperation had arisen, largely because of lack of responses from the Soviet side. We attributed Soviet slowness to administrative problems rather than to policy decisions. The US working group chairman visited the USSR to break the log-jam and obtained satisfactory answers to all of some 40 outstanding issues. The Soviets appointed a full-time assistant to their working group chairman to coordinate and expedite Soviet activities. They submitted long-awaited papers, which had been presented at a previously-held transport seminar, and agreed to joint publication. Most significantly, Gosplan has agreed for the first time to host American specialists for long-term visits to study Soviet use of computers in planning and balancing the national economy and Soviet computer-based applications and methodology in economic-data systems. Plans were advanced for over 20 joint working meetings and seminars to take place in 1976. The Soviets promised to provide papers before the meetings and expressed enthusiasm for joint publication of results.

We also learned that the Soviets have not yet resolved their internal questions on funding long-term Soviet visitors to the US.

Another continuing problem is last-minute changes of plans. Although previous such experiences led the Joint Commission to agree that meeting dates would not be changed less than a month before the event, the Soviets informed us in late April that three meetings could not take place before June 10. One of these, on Decision Making, involved a Soviet delegation expected in the US on May 2, even though we had gone to considerable trouble to accommodate their earlier expressed preference for the May 2 timing. Another involved the Large Cities Project, for which we had experienced a no-show last fall. This time we speculate that the Soviets may simple have run out of funds until June 10.

Chemical Catalysis

The exchange of long-term research fellows continued in a satisfactory manner. The Soviets indicated that the US principal investigator who had been informally denied permission to travel to Alma Ata last year under the Catalytic Systems Project would be granted such permission if he were to reapply.

Electrometallurgy

In this exchange, all projects except Electroslog Remelting have been going reasonably well.

The Electroslog Project has suffered from Soviet negligence and procrastination in transferring data to us. There does not appear to be any basic Soviet reluctance to do so, however, and they are cooperating fully with us in laboratory work. We have advised them at the working level that their failure to improve their record in transferring data could lead us to reconsider electroslog cooperation and this would have implications for the other projects as well. Advanced Soviet electroslog techniques for shape casting of items, such as electric power generators and valve bodies, could provide significant dollar savings over US forging techniques.

A Soviet item of considerable interest is a high-nitrogen steel half-ton ingot recently shipped to us under the Plasma-Arc Project. Soviet claims for the ingot include very high tensile strength and good weldability with sufficient nitrogen to permit lower content of expensive nickel. The Battelle Institute has now begun to test the Soviet ingot to ascertain whether the Soviets have indeed achieved a breakthrough.

Progress has been even and satisfactory in the Electron Beam Evaporation Project. The Soviets have taken a different approach from us to metal coatings and the coating process. Work is underway to compare the two approaches and correlate structures with behavior of coatings under different conditions. Should Soviet claims be borne out, there is a prospect that cutting tools could be manufactured in ways that save millions of dollars for metal working industries.

Two kinds of materials were exchanged for testing in US and Soviet laboratories under the Welding Materials Project and the Engineering Properties Project. With the former, both sides seek to standardize testing procedures and develop predictions which can advance theory in addition to actual testing. In the latter, nickel, steel, and aluminum alloy materials were shipped to US Government (NBS-Boulder) and private (International Nickel, ALCOA, ARMCO) laboratories to determine how advanced the Soviets are relative to us in joining such materials.

Regrettably, these last two shipments to the US and that of the Soviet high-nitrogen steel ingot were delayed considerably, partly because of US customs procedures. An interim precedent has been established as a result of these cases, but we need to reach a full solution to preclude problems in the future (see discussion under US Administrative Problems).

Forestry

There was no activity planned during the first quarter. A US forest ecosystems group is visiting the USSR in May.

Intellectual Property

Just after the quarter ended, agreement was reached at the second meeting of the Working Group in the US on statements concerning inventions and concerning information and confidentiality. The S & T Joint Commission had allowed for difficulties the working group would have in doing this by

requesting a report on continuing areas of disagreement, if there were such. However, the negotiators reached agreement on all outstanding differences on these subjects. The Soviet side asked that the resulting agreement be made subject to confirmation within 60 days, explaining that this was because they had exceeded their instructions.

The agreed statement on inventions deals primarily with the division of rights in third countries to inventions arising out of cooperative activities. To cover the contingency if special arrangements are not agreed on a case-by-case basis, the statement includes specific provisions for the division of such rights. The agreed statement on information and confidentiality permits each side to publish information received from the other except in carefully defined circumstances involving respect of confidentiality for material not resulting from cooperative activities. The statement also provides that information in a report of invention may be published upon application for a patent or inventor's certificate in any country and that requests to withhold publication if no patent is applied for are to be limited to nine months from the date both cooperating sides receive the report of invention.

Metrology

During the quarter there was considerable activity in the field of Standard Reference Data. Two Soviet experts worked with the staff of the NBS Thermochemical Data Center to agree

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on a set of key values of thermodynamic properties. In addition, a meeting of the Standard Reference Data project group formalized exchanges of published documents that have been taking place for several years, agreed in principle on the exchange of translation and reproduction rights on a quid pro quo basis, and summarized technical areas considered most promising for cooperation: thermophysical properties of fluids, thermochemical properties of various substances, atomic and molecular data, solid state properties, chemical kinetics, and nuclear data.

The US rejected the four new metrology topics which the Soviet side proposed last October, because NBS is not active in the measurement of electromagnetic characteristics of materials at high and superhigh frequencies and the American Petroleum Institute is already cooperating with Gosstandart in the other three topics: metrological assurance for measuring (a) liquid and gas flow rates, (b) the quantity of oil and oil products transported in tankers, and (c) humidity in oil. However, we have notified API that NBS experts are available to them in their collaboration with Gosstandart.

The US has sent to the Soviets US test results on Soviet thermocouples and five thermocouples of US manufacture which the Soviets will test.

Microbiology

There was activity in all project areas and an increase in long

A joint meeting on single-cell protein was held at M.I.T. under the Feed Proteins Project. The Soviets presented meaningful papers and were generally more forthcoming than they had been in similar previous meetings. We believe they are now prepared to move into applied research rather than stress industrial and commercial development. A US firm active in this field had previously declined to receive Soviet visitors but, on this occasion, did receive the Soviet delegation attending the conference. Also in this project, a Soviet researcher working with US researchers at NABISCO has developed a faster and more convenient way to test the nutritional quality of protein using protozoan microorganisms instead of rats.

The Soviets claim to have developed a mutated yeast strain which uses hydrocarbons to produce single-cell protein in a manner that meets FDA requirements and, under the Molecular Biology Project, have made it available to our researchers for verification. This could be of significant future value as a new method to produce animal feed or fodder. In return, the Soviets have received a US yeast storage technique developed at the University of California at Berkeley.

The US and the Soviet project chairmen have developed a new joint proposal for work in the Pests Project. However, we are still waiting for word that the Soviets approve the program. In the meantime, we have provided the Soviets with certain insect cell tissue cultures.

Physics

The US working group chairman wrote to his Soviet counterpart to suggest that they get together to discuss next steps in developing a joint program. The Soviet Academy's letter of last November stated that the last joint proposal of the US and Soviet working group chairmen was unacceptable.

Science Policy

Two projects, on financing research and development and on manpower utilization, were revived as a result of renewed Soviet activity stimulated by a visit to the USSR by the US working group chairman. A new Soviet coordinator has been named for the financing project, to replace a man who died last year. Prospects for the manpower project may also be improving. For instance, the Soviets have agreed to provide absolute as well as relative data. Through this project we hope to obtain significant data on use of Soviet manpower not previously available.

Scientific and Technical Information

In the forecasting and cost/benefit area the mismatch of specialists is a continuing problem. With the merging of the two groups into one, we had hoped that new, more theoretical research-oriented Soviet specialists would become involved. However, the person selected to head the Soviet side of the merged group follows the previous pattern of involving only management and operating personnel from a very few institutions.

Accordingly, we see little prospect for improvement and have suggested that, before exchanging names of specialists, the US and Soviet Chairmen first discuss in person how we can match persons and interests.

We responded to a Soviet suggestion that the receiving side provide interpreting services when needed by exchangees by expressing our preference to handle each situation on a case-by-case basis.

The US Working Group Chairman has asked the Soviet Chairman for an inventory of energy information and data resources.

Standardization

The USSR sent us six papers on Soviet standards which we found not particularly valuable. We sent no material to them. However, we are endeavoring to obtain for them information regarding the teaching of standardization subjects in the US.

Water Resources

In April a Soviet delegation visited the Corning Canal under the project on automation of irrigation systems. This was a return visit; a US delegation had previously visited canals in the USSR and obtained considerable useful technical information.

In preparation for a working group meeting this summer, the US side has reviewed the entire water resources program to identify priority areas. Lower priorities for which a reduction in the level of planned activity is being considered include prospective planning, design and construction of large water

projects (e.g. diversion of waterways), and automation and remote control systems. We believe that in these areas Soviet experience has limited applicability to current US technical problems.

Soviet Bureaucracy

Experiences in application of computers to management and in science policy indicate that trips to the USSR by US working group chairmen with the explicit objective of expediting activity can be effective in overcoming Soviet bureaucratic bottlenecks.

US Administrative Problems

Soviet alloys and weldments languished in US customs for many weeks while we struggled to find some procedure to permit entry. In the past materials being exchanged had for the most part been small enough to be transmitted through the diplomatic pouch or carried by travelers. Larger Soviet items had been processed through US customs using the procedure for importing items for use by the Soviet Embassy. However, in the case of alloys and weldments, the material became USG property upon entry and the consignee was the private company which had agreed to perform tests for the working group. The solution finally worked out was to use the procedure for temporary import under bond of materials for testing. This procedure calls for return or destruction of the materials within a year or two, which may not be in our interest. This experience suggests the need for

development of a special procedure for duty-free import of materials received under inter-governmental cooperative programs.

Fortunately the solution for the alloys and weldments was available as a precedent for quick application to the more important ingot, when it arrived.

Private Sector

During the quarter two more firms (Revlon, Deere) concluded technical cooperation agreements with the Soviet Union under Article IV of the S & T Agreement.

MEDICAL SCIENCE AND PUBLIC HEALTH

Major developments in the Health and Artificial Heart cooperative programs during this quarter included the exchange of the first US artificial heart device plus control unit for testing in the USSR during March. Other highlights included the visit, shortly after the quarter, of two Soviet scientists to the US during April to review current US experience with swine influenza virus.

There were no significant problems occurring within the Health and Artificial Heart programs during the quarter, and Soviet performance was satisfactory. While the level of scientific activity was somewhat slower than that of the preceeding quarter, all the US coordinators considered the rate of progress to be satisfactory.

We have informally proposed the inclusion of a new joint project within the Environmental Health area, to cover the

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biological and environmental effects of electromagnetic fields caused by high voltage power transmission lines. This topic has long been of concern to US scientists and we would like to determine what approaches the Soviets might have taken to deal with it.

Cardiovascular Area

The US and USSR exchanged data on demographic, biochemical, and cardiologic results from a number of projects, including a study of 4,000 persons from each side to determine preliminary indications of lipid protein levels. The aim of the lipid protein studies is to add to our knowledge of factors in longevity and risk factors in heart disease. On preliminary view, the Soviet data showed that its test pool may be incurring lesser degrees of risk of heart disease than the US group. In a related project, two Soviet scientists visited NHLI in March for the lipid clinics program.

In ischemic heart disease research, the pace was slowed somewhat because the Soviets canceled a delegation slated to visit in May. On a more positive trend, plans have been finalized for the Third Joint Symposium in Myocardial Metabolism, to take place in the US in 1977. Also in a positive vein, the Soviets have provided the US side with useful information on Soviet heart transplant work, even though this is not required under any formal protocols.

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In the topic areas of Sudden Death, planning continued for the June 76 visit of a Soviet delegation. A slight hitch in this project was caused by the delayed arrival of a Soviet bibliography which was due in January and turned up in March.

In the blood transfusion project area there were positive trends. A US scientist sent to the USSR did receive inclusion of all centers originally proposed by the US side, and this is a healthy sign of the attention both sides are placing on better programming.

Cancer Research

The US-USSR program Review for Cancer Epidemiology was held in the USSR during March 15-25 and resulted in an important new arrangement for exchange of breast cancer data between the USSR coordinating center in Tallinn and the US center at Harvard. Planning continued for the annual Program Reviews in Cancer Chemotherapy, Immunology, and Virology.

The exchanges of drugs, data, and literature in topic areas such as mammalian somatic cell genetics and cancer control/cancer centers have continued routinely through the quarter.

Environmental Health

In the environmental health topic areas we informally floated a proposal for including a new project in this area to assess biological and environmental effects of electromagnetic

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fields caused by high voltage power transmission lines. We have not yet received a Soviet reaction to the proposal, which covers a topic of longstanding interest to us. In a tie-in with cancer research, informal agreement was made by the two sides to develop a joint program for assessing the biological effects of nitrosamines, which have been linked to cancer in some ways.

Influenza/Acute Respiratory Diseases

There has been considerable activity in this topic area with the continued exchange of influenza strains and data related to epidemics, particularly that of the swine influenza virus. As was noted earlier, two Soviet specialists visited DHEW's Center for Disease Control in April to discuss swine flu preventive programs.

Arthritis

In this area, activity was routine. For the US side a major portion of activity was devoted to a National Institute of Arthritis comprehensive review of potential contracts with US university research facilities in support of portions of the US-USSR cooperative requirements.

Mental Health/Organic Basis of Schizophrenia

We sent 24 bottles of hypaque solution to the USSR for use in this project, and also sent bibliographic materials to the Soviets.

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Artificial Heart Research

The exchange of the first US artificial heart device and its control unit took place in this quarter. The US device was implanted in a calf, while a Soviet device was implanted in another calf for a parallel test by a joint team of US and USSR surgeons in Moscow. During the visit of the US specialists for this joint effort, the Soviets discussed the exchange of five of their heart devices and revealed artificial heart technology which the US team felt was comparable with that found in the US. Five Soviet devices were received by the US in May, to be used in joint testing in the US in June. With the achievement of this exchange and of the first joint heart implants, one more problem area has progressed to the level of joint work. The visit of the US artificial heart team received a significant amount of media coverage in the USSR. They visited the key Soviet institutes involved in artificial heart work in the cities of Moscow, Leningrad, and Tbilisi, and felt that they had experienced a useful program which contained the amount of contact with Soviet specialists and locations that they had requested.

Individual Exchange Program

During February we chose five candidates for individual exchanges in the following topic areas: the role of the district physician in primary health care in the USSR; study

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of the neural basis of psychomotor behavior; study in neurophysiology; study in combined virology/cellular biology; and study of Soviet biomedical information institutions and organizations. The biomedical information project fulfills a particular proposal made by the US National Library of Medicine.

Private Sector Developments

In addition to the Soviet purchase of two Technicon Autoanalyzer II Models as noted in the previous quarterly report, there have been some indications that the Soviets have ordered a US lab freezer for use in the same project area (cardiovascular). As was also noted in the previous report, there has been an agreement between the Bristol-Myers Company and the Soviet State Committee for Science and Technology for the joint development of some anti-cancer drugs. It was the understanding of the US National Cancer Institute that a specific licensing agreement was to be signed this quarter concerning production of the Soviet anti-cancer drug Ftorafur in the US. However, such an agreement has not yet been completed. The National Cancer Institute will continue to monitor the situation.

Upcoming Events

The area of Artificial Heart Research and Development promises to be the single most important area for progress during the second quarter. Plans for testing of the Soviet

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heart devices here in the US are going forward at an advanced stage and it is expected that a Soviet team will arrive in the US to begin the tests in June.

ATOMIC ENERGY

Fundamental Properties of Matter (FPM)

In view of their good work and expertise developed during a related experiment, the US lab chief at Fermilab requested a nine months' extension of stay for three Soviet scientists from the Joint Institute for Nuclear Research (JINR), Dubna. They will work with US colleagues and a Polish scientist, also from JINR, on experiment #456, the "Investigation of the Kaon Form Factor by Observing Kaon-Electron Interaction at 250 GEV."

In March, the Director, Fermilab, sent an invitation to three well-known Soviet theoreticians to spend a year at Fermilab participating in Joint US-USSR theoretical physics studies under the Atomic Energy Agreement.

Negotiations by mail are continuing between the JINR and the Director, Oak Ridge National Laboratory (ORNL) regarding the framing of a protocol for joint studies on superheavy element synthesis and their physical and chemical properties. The joint work, to be undertaken pursuant to the US-USSR Atomic Energy Agreement, will be aimed at resolving a scientific dispute over heavy elements said by the Soviets to have been newly isolated by their scientists. According to our information,

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these new Soviet heavy elements are very short-lived; some US scientists believe they are too short-lived to merit being named as true heavy elements. We expect that the US-USSR joint work at Dubna is likely to lead to a greater understanding of the physical and chemical properties of superheavy elements and should lead to mutual understanding on the matter of the Soviet claim. We anticipate that two ORNL scientists will work at Dubna for two months this summer on the experiment. The US side will prepare and ship to Dubna a target of enriched plutonium for use in the heavy element study; the target will be in the custody of the two US scientists and will be expended during the experiment.

At a meeting at Stanford University, California, on March 30, 1976, a six-member US delegation was chosen to attend the international conference on Very Big Accelerators to be held at Serpukhov, USSR, May 17-28, 1976. The delegations established a study group which is to initiate consideration of the building of a very large international accelerator. Fermilab Director Wilson headed the US delegation to this conference under the 1976 plan of cooperation in FPM.

Controlled Thermonuclear Research

In January, two Soviet CTR experts completed a four-week stay at Princeton Plasma Physics Laboratory participating in the start-up of the Princeton Large Torus. During the same month, three US CTR experts spent four weeks at the Kurchatov Atomic

Energy Institute, Moscow, observing the start-up of the Tokamak-10. US scientists reported the visit to be eminently successful in terms of information gained of value to the US CTR program. The T-10 was ready to go upon the US team's arrival and operated throughout the stay. The US scientists were provided complete access to personnel and equipment in the CTR division at Kurchatov and they were able to make measurements on the T-10 and visit other experiments. These two exchanges, under the plan of cooperation for CY-1976, provided detailed knowledge by each side of the other's results on comparable CTR machines to maximize the use of the data obtained utilizing these two facilities.

The two Soviet CTR experts who had been working on the Alcator experiment at MIT (the MIT Tokamak) since autumn 1975 completed their participation in this experiment during the first quarter of 1976. The addition of these two Soviet specialists, in effect, to the MIT staff working on the Alcator experiment, significantly increased the capability of the small MIT staff on this project without requiring increased university funding for staff support since the CTR exchanges are on a "sending side pays" basis.

The Soviet scientists worked at MIT to adapt a charge exchanger particle analyser on the Alcator Experiment. The analyser is a good diagnostic modularized unit for measuring what occurs in a plasma, and the use of this Soviet equipment

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will provide a check on the results obtained using US-made equipment for this purpose. It was unfortunate that the Alcator broke down for a portion of the Soviets' visit but it is expected that a second team of Soviet scientists will be coming later to run the actual experiment. While the machine was down the Soviet scientists assisted in analysis of data already taken.

During the quarter, two Soviet scientists attended an international conference on surface effects at San Francisco and briefly toured ERDA laboratories for discussion and information exchange on the subject of materials development work for fusion.

Fast Breeder Reactors

During January 1976 a Soviet fast breeder reactor delegation visited the US to attend a seminar on safety of nuclear power plants with liquid metal fast breeder reactors. Considerable information was exchanged at the seminar with both sides agreeing that a substantial improvement in mutual understanding of safety approaches and procedures had resulted. The seminar showed that the basic safety and reliability problems in the design, construction, and operation of early fast breeder reactors have been solved, but that broad application of fast breeder reactors requires more work on equipment systems and instruments for general reliability, increased design flexibility and confidence in their safety.

In January-February, ERDA made the following proposals to the SCAE: the exchange of cladding and duct material under which the US will provide the USSR 100 meters of Fast Flex Test Facility (FFTF) reference cladding material and the USSR will provide the US a like amount of BN-350 reactor reference material; the exchange of steam generator and intermediate heat exchanger tubing unexposed to sodium. An ERDA follow-up telegram of April 16, 1976 informed the SCAE that ERDA is prepared to ship five tubes, each 2.7 meters long, of intermediate heat exchanger tubing by air to Moscow upon confirmation of SCAE readiness to accept this shipment. Technical details for the study of the possibility of testing a Clinch River Breeder Reactor (CRBR) prototype steam generator evaporator at CRBR pressure and temperature conditions in the BN-350 spare loop at Shevchenko have also been sent to the State Committee for their consideration.

Responses to the US proposals were received early in the second quarter. Accordingly, US tubing will be dispatched very soon to the USSR and a meeting of experts in cladding will convene in summer in the USSR. In the case of the possibility of testing a Clinch River Breeder Reactor prototype in the BN-350 spare loop at Shevchenko, the Soviets suggested further study of certain technical and economic questions and an examination of the subject at the FBR Joint Coordinating Committee meeting to be held in the USSR in September.

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Upcoming Events

The third US-USSR Joint Fusion Power Coordinating Committee meeting will take place in Moscow June 1-9, 1976, to consider CTR exchanges for 1977. The level of exchanges in man-hours for CY-1977 is expected to approximate the level of exchanges in man-hours for CY-1976.

In March, the US side accepted the starting date of July 26, 1976, for the fourth US-USSR Joint Seminar on FBRs. This seminar, entitled "Some Problems of Reliability and Safety of Steam Generators for FBRs" will consider the following: large and small sodium water reactions, small lead sodium water reactions, acoustical detection of leaks in steam generators. Fourteen US specialists will travel to the USSR to participate in this seminar and each side will present ten papers.

Soviet Bureaucracy

The proposed protocol for the ORNL-JINR collaboration on superheavy elements noted earlier was signed for the JINR by the Director of the Laboratory of Nuclear Reactions and "approved" by the Director of JINR. Our only previous experience involving the concluding of agreements for joint experiments between the JINR and ERDA laboratories concerned a "Memorandum of a Collaborative Experiment" signed by the Director, Argonne National Laboratory (ANL) and the head of Moscow State University, one of the collaborators in a three-way ANL-JINR-Moscow State collaboration. We understood at that time that the JINR as an

international organization would not sign a protocol for a joint experiment with an ERDA laboratory. However, it is evident that, if there is enough official interest in a particular joint experiment, (in this case, the prospect of gaining US acceptance of a Soviet scientific achievement) presumed administrative difficulties can be overcome. In this case, D. Flerov, renowned Soviet heavy elements experimenter, signed the proposed protocol for the JINR, which was then signed as "approved" by the Director, JINR.

EXECUTIVE SECRETARIAT Routing Slip

TO:		ACTION	INFO	DATE	INITIAL
1	DCI				
2	DDCI				
3	D/DCI/IC				
4	DDS&T				
5	DDI		X		
6	DDA				
7	DDO		X		
8	D/DCI/NI		X		
9	GC				
10	LC				
11	IG				
12	Compt				
13	D/Pers				
14	D/S				
15	DTR				
16	Asst/DCI				
17	AO/DCI				
18	C/IPS				
19	DCI/SS				
20					
21					
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SUSPENSE		Date			

Remarks:

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